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TINCTURA FERRI CHLORIDI.

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Careful pharmaceutists very often meet with difficulty in making this preparation in accordance with the officinal (U. S. P.) formula, whilst those less careful obtain a preparation very deficient in the iron, but containing an excess of hydrochloric acid.

Freshly made subcarbonate of iron, if dried at a temperature below 100° F., will almost always dissolve in the prescribed proportion of acid. If, however, the subcarbonate be not recently made, or if it be washed often with hot water in the preparation, even though dried "with a gentle heat," a notable proportion of it will resist the action of the acid. The common faults in its preparation are the washing with "hot water," and drying at a temperature above the prescribed "gentle heat."

The preparation of a soluble subcarbonate has been more uniformly successfully accomplished in the writer's hands by precipitating from warm, not hot solutions, washing the precipitate with cold water, by decantation, and drying at a "gentle heat," or below it. In practice with all preparations of sesquioxide of iron the writer's observations are entirely in accordance with the recent experiments and researches of M. Péan de Saint Gilles, (Ann. de Chem. et de Phys. 1856. Vol. xlvi. p. 47, et seq.) wherein he concludes "that the action of heat upon hydrated sesquioxide of iron determines first a partial elimination of water; then, when the action is prolonged, it destroys little by little the basic affinities of the oxide and produces a true allotropic transformation."

In the preparation of the tincture of the chloride from a solu-

in strength, the preparation will not remain clear ; for the officinal subcarbonate always contains a little carbonate of protoxide, which latter forms protochloride at first. This protochloride is afterward gradually decomposed, and forms sesquichloride and sesquioxide, when, through the deficiency of acid, the oxide is deposited as a sediment.

The filtering of the solution of chloride of iron of the Pharmacopœia process is very tedious and troublesome, and cannot be rendered less so by any ordinary management ; so that although the process is in principle unobjectionable, it is yet so difficult and troublesome in practice that perhaps very few follow it with success.

If the subcarbonate be replaced by magma of hydrated sesquioxide, the saturation of the acid is easily accomplished ; but, with the slightest excess of magma the filtering becomes more difficult than before, or is almost impossible. In the use of this substitute for some time, the difficulty in the filtration was in great measure avoided by subtracting one thirty-second part of the prescribed acid, then saturating the remainder as nicely as practicable, and finally restoring the portion of acid separated, and digesting before filtration. In this way an excellent preparation was obtained, having the strength of the acid for an index of strength and uniformity.

A much better, because a much easier, more simple and more direct process is that now adopted. This is a mere adaptation of the old process for obtaining pure sesquichloride of iron, and is used as follows, the quantities being five times greater than those of the officinal formula.

Take of	Iron filings or card teeth,	18℥ =1lb. 4oz. Av.
	Muriatic acid, (s. g. 1·16)	5 pints= 5lbs. 14oz.
	Nitric acid, (s. g. 1·42)	Q. S. say 4¾f.℥. =7½oz.
	Alcohol, (s. g. ·835)	15 pints.
	Distilled water,	3 pints.

To the iron filings placed in a ten pint flask add 3 pints 4½f.℥. =3lbs. 14oz. av., of the muriatic acid and 8f.℥. of the distilled water. When the spontaneous reaction has subsided, boil gently for four hours, add one pint of distilled water, heat again to boiling, and strain off the hot solution. Wash the flask and residue with 8f.℥. of distilled water, and rinse the strainer through with

ble subcarbonate, if the acid be in the smallest degree deficient

the washings, receiving them into the original solution. To the strained solution, in a flask, add the remainder of the muriatic acid and heat the mixture. Then add, by small portions, the nitric acid until it falls into the hot mixture without effervescence, boil for half an hour and set aside to cool. When cold make up the measure to five pints with distilled water, and add the solution to the alcohol.

The yield of finished tincture is 19½ pints; and the s. g. .992. One fluid ounce = 456 grains of this tincture yields 32·04 grains = 7 per cent. of sesquioxide of iron, or, 64·8 grains = 14.2 per cent. of sesquichloride of iron.

If the acid be of the prescribed strength the proportion indicated dissolves 15¾ oz. of the iron, leaving a residue of 4¼ oz. A calculation upon this basis gives 63·94 grains as the proportion of Fe_2Cl_3 in solution in each fluid ounce, thus verifying the direct experiments within ·86 grain.

The flask is best heated on a sand bath during the saturation, and the point of saturation is determined within practical limits by removing the flask, and observing that when the boiling has completely ceased but few bubbles of hydrogen rise from the residuary iron. The time required for saturation varies, that named being the maximum. The solution is now of a beautiful deep green color, and contains protochloride of iron free from sesquichloride, in proportion as the iron used was free from sesquioxide, and in proportion as access of air has been prevented, but it is so concentrated that it deposits crystals of $FeCl+4Ho$, as soon as it begins to cool. Hence the necessity for adding the pint of distilled water, and heating up before attempting to strain. The straining (through muslin) is easily and quickly effected, and with little loss. The strained solution need not be heated to boiling before the additions of the nitric acid are commenced; and the additions should be cautiously and carefully made at first, that the violence of the reaction may not cause loss of liquid with the extricated vapors, and toward the close that an excess of nitric acid may be avoided. As soon as the acid, added in drops, falls quietly into the surface of the hot solution the purpose is fully accomplished. The half hour after boiling is useful in driving off the oxides of nitrogen that may have been dissolved, but should be shortened or omitted altogether in operating

with small quantities lest the small excess of muriatic acid needed in the tincture be lost or reduced. As the nitric acid is added the color of the solution changes rapidly to brown, and when the acid ceases to produce effervescence the solution gives a negative indication with the $3KCy, Fe_2 Cy_3$ test solution.

The finished solution being perfectly clear and bright requires no filtration. When cold, made up to the measure, and mixed with the alcohol, a contraction of volume occurs equal to 7 or 8f.℥ or about two per cent. by volume, and a fine effervescence occurs coincidently with slight rise of temperature.

If the iron be pure, (free from silica and alumina,) and the small excess of HCl be not driven off, this tincture keeps well and free from turbidity or deposite, and has the important proportion of hydrochloric ether necessary to its proper medicinal action in certain cases. As this ether, whatever its precise nature or composition may be, is gradually formed, and probably through the excess of HCl, and as it is important if not indispensable to the proper effect of the tincture in spasmodic affections of the urinary organs, the preparation should not be used when newly made. It probably becomes better the longer it is kept.

Naval Laboratory, New York, May 1857.

ON FLUID EXTRACT OF ARNICA.

By J. M. Maisch.

In several establishments in New York, an article is sold under the name of extract or fluid extract of arnica, and recommended as an external application for sprains, bruises, insect bites, &c., for which the tincture of arnica is usually employed as a domestic remedy. I have not seen any formula for the preparation of this fluid extract, and have therefore endeavored to find one, by which all the medicinal virtues residing in the arnica flowers might be preserved. The flowers as well as the root, both of which have been employed medicinally, have not been subject of chemical analysis for upwards of ten years, and we therefore know comparatively but little of their constituents. According to the old analysis of Chevallier and Lassaigne the flowers contain besides anorganic salts, albumen, gum, coloring matter,

gallic acid, resin, a little volatile oil and a brown acid extractive matter, to which they applied the name of arnicine, and which probably contains the *arnicina* of Mr. Bastick. From this statement it would appear that alcohol is the best menstruum for extracting the flowers, inasmuch as it will dissolve the gallic acid, resin, volatile oil, and the so-called arnicine. In accordance with these suggestions I took of

Alcohol	a sufficient quantity,
Arnica flowers	℥xvj.
Alcohol, 95 per cent.	Oiss.

and exhausted the flowers, which had been previously passed through the mill, by the alcohol, and evaporated the liquid to eight fluid ounces which were mixed with the 95 per cent. alcohol, well shaken, and after several hours filtered. The preparation seemed to possess in a high degree the medicinal virtues of the flowers, which in the form of a tincture have made them a popular remedy for external application.

The tincture is prepared with diluted alcohol, which accordingly would seem a good menstruum for exhaustion. I have therefore recently altered the above process somewhat by substituting diluted alcohol for alcohol, evaporating the resulting tincture by means of a water bath to the consistency of an extract, and redissolving it by two pints of ordinary alcohol; or the evaporation might be stopped when the liquid measures four fluid ounces, which would have to be mixed with 28 oz. of 95 per cent. alcohol, thus bringing the alcohol down to about 85 per cent., the officinal strength.

Prepared in either way, this fluid extract is of a dark brownish color, possessing in some degree the peculiar odor of the flowers; its strength compares with that of the fluid extract of valerian, containing the virtues of one ounce (Troy) in 2 fl. oz.; of this strength it might perhaps be found useful as an addition to rubefacient liniments and for the bites of insects. I have tried it often with musquito bites; they are little troublesome after the application of but a few drops, and the inflammation which usually follows, is in most cases easily arrested if the application be not deferred too long.

Philadelphia, May, 1857.

ON THE SEEDS OF STRYCHNOS IGNATIA.

By James M. Caldwell.

(*An Inaugural Essay.*)

Our knowledge of this plant is derived almost entirely from the Jesuits, who conferred upon it the name of the founder of their order, as an evidence of the high esteem with which they regarded it. But little attention however had been bestowed upon it by the medical world, till a printed notice, published by a clergyman of a sister State, detailing the beneficial results he derived from the use of an alcoholic extract of the beans, attracted the attention of medical men, who having witnessed the results of numerous and carefully conducted experiments, have settled the fact of its being, as might be expected, a remedy of great power, and, under judicious advice, a valuable addition to our list of Materia Medica.

Description of the Plant.—"This tree is indigenous to the Phillipine Islands, and is described as the product of the Ignatia amara by the younger Linnæus; as it is now considered by botanists as a species of Strychnos, it is therefore called the Strychnos Ignatia. It is a tree of middling size, with long cylindrical vine-like branches, which bear opposite, nearly sessile, oval, pointed, entire and very smooth leaves. The flowers are white, tubular, fragrant, and arranged in short axillary racemes. The fruit is about the size and shape of a pear, with a smooth, whitish, ligneous rind, enclosing about twenty seeds, embedded in a dry pulpy matter, and lying one upon the other." (Wood & Bache.)

Appearance of the Beans.—We very rarely, if ever, obtain the beans in the attached state, or in the form of the fruit. As found in commerce they vary from half an inch to an inch in length, from a quarter to half an inch in breadth, and somewhat less in thickness. They are somewhat convex on one side, having three or four faces on the other. Others again are very irregular, and much compressed. They vary in color from a grayish brown to a black, and when contused present a reddish brown appearance, and the particles are slightly translucent. They are very hard and horny, and difficult of pulverization, inodorous in the dried state, and intensely bitter.

Strychnia.—These beans contain a larger per-centage of this alkaloid than the strychnos nux vomica. I employed the following process for isolating it:

Two thousand Troy grains of finely contused beans, were macerated in cold water, acidulated with muriatic acid for ten days. The clear liquid was then decanted, and the residue subjected to contusion with an equal bulk of well washed sand; this was heated in a water bath with the addition of a pint of acidulated water for one hour, and again contused with more sand; by this process the residue was reduced to a pulpy mass, which was introduced into a glass displacement apparatus, and the liquid obtained by the first maceration allowed to percolate slowly through it; the displacement process was then continued until the mass was completely deprived of its bitterness.

The liquids obtained by desplacement were mixed and evaporated to the consistence of a syrup, and the gum precipitated by alcohol. The alcoholic solution was then filtered and evaporated over a water bath to the consistence of an extract, this extract was dissolved in cold water, and by this means the muriate of strychnia, being a soluble salt, is obtained in solution, and the fatty matter, which exists in small quantities, is also separated. This solution was next heated, and the strychnia precipitated by a slight excess of the milk of lime, and allowed to stand for several hours. The precipitate was carefully collected and dried and treated with boiling alcohol (95 per cent.) and filtered, and allowed to crystallize spontaneously. These crystals were next dissolved in boiling alcohol, and treated with purified ivory black, taking the necessary precaution to treat the ivory black with boiling alcohol to dissolve any strychnia which may have been taken up by it during the process of decolorization. The solutions were filtered and allowed to crystallize; the crystals were redissolved in boiling alcohol of the previously mentioned strength and allowed to crystallize spontaneously, when they were collected and found to weigh fifteen Troy grains.

As commercial strychnia is generally impure, its chief contamination being brucia, which adheres to it more or less in the processes used for isolating it, the above specimen was tested and found to be perfectly pure.

Brucia, according to the analysis of Pelletier, exists in this

plant, but in a much smaller amount than in the Nux vomica, while the strychnia predominates in the Ignatia amara. The presence of brucia is readily recognised by nitric acid producing the deep red color, with a decoction of the beans.

Igasuric Acid.—This acid, which is by some chemists called strychnic acid, exists in the beans in combination with strychnia and brucia in the form of an igasurate of these alkaloids. The following process was employed for obtaining it:

A quantity of the contused beans were macerated, and then treated with successive portions of cold water, until their bitterness was completely exhausted. The solutions were then carefully evaporated to the consistence of a syrup, and the gum precipitated by means of alcohol; this alcoholic solution was filtered and evaporated by the aid of a water bath to the consistence of an extract. This extract, which consisted principally of igasurate of strychnia, was dissolved in cold water, and treated with an excess of the acetate of lead, and the igasurate of that oxide allowed to subside. The precipitate was next washed and placed in water, and decomposed by a current of sulphuretted hydrogen. The solution of igasuric acid was then separated from the sulphuret of lead by filtration; being still impure, it was digested with ivory black, and again filtered, when it was carefully heated and allowed to crystallize.

From seven hundred and twenty grains of the beans, treated in the manner above described, I obtained eight grains of pure igasuric acid. It crystallizes very rapidly when placed in a warm atmosphere, in long acicular crystals, of a white color, having an acid taste, and an acid reaction, producing with a neutral solution of the sulphate of copper, a beautiful light green precipitate, a characteristic so peculiar to this acid. This acid by an increase of heat is decomposed, being converted into a dark brown substance.

In consequence of the small amount obtained, I was unable to make any further experiments.

Volatile Principle.—By submitting a quantity of the contused beans, after two days maceration to distillation, a clear transparent liquid was obtained, which was devoid of taste, but having a strong odor, very analogous to that of the beans. This upon standing deposited a white flocculent precipitate, and the odor

was gradually dissipated. From the foregoing phenomena, it is natural to suppose that the beans contain a volatile principle (probably an oil) which, when exposed to the air, absorbs oxygen, and in this respect resembling the volatile oils.

Alcoholic Extract.—Several methods have lately been proposed for the preparation of this extract, all amounting to the same thing, the only precaution being to insure a complete exhaustion of the beans, and a careful evaporation.

From thirty-five hundred grains of the beans I obtained three hundred and eighty-eight grains, or about eleven per cent. of extract. The extract is of a dark brown appearance, and has a strong, not unpleasant odor, very analogous to the odor of the distillate mentioned in a previous article. This extract is very powerful; half a grain dissolved in a drachm of alcohol, proved fatal to a small cat in the space of three or four minutes, with all the symptoms of poisoning by strychnia.

Is starch present in the beans?—According to the analysis of Pelletier and Caventou starch is said by them to be a constituent of the beans. For the purpose of corroborating this statement, a decoction was prepared by boiling half an ounce of the contused beans in a pint of water down to half a pint. A portion of this decoction, when cool, was tested with a solution of iodine, but without success.

To be better satisfied, a still more delicate test was employed, viz.: by adding to this decoction a few drops of nitric acid, and to this a solution of the iodide of potassium; the acid united with the potassium to form nitrate of potassa, and thus the iodine was set free, coating the sides of the tube, without producing the deep blue color so characteristic of the presence of starch.

Gum.—The gummy matter obtained by precipitation by alcohol, in the process employed for isolating the strychnia, was carefully collected and dried, and found to weigh three hundred grains. This was very adhesive, and resembled true gum in every particular, devoid of taste, soluble in water, but insoluble in alcohol. A solution of the subacetate of lead added to a solution of the gum, produced a dense precipitate which was redissolved by an excess of acetic acid.

A small amount of fatty matter or fixed oil exists in the beans, soluble in alcohol and ether.

Resin.—A tincture was prepared by macerating a portion of the contused beans, in an equal proportion of alcohol and ether for several days, which upon the addition of water, was rendered slightly milky, and upon being allowed to stand for a few hours deposited a small amount of resin.

Coloring Matter.—Yellow coloring matter is also a constituent of the beans; it is soluble in alcohol and water, but insoluble in ether.

The decoction of the beans slightly reddens litmus from the presence of igasuric acid.

Tincture of iodine produces a yellowish brown color with the decoction.

Tincture of the sesquichloride of iron produces a greenish coloration with the decoction; but this does not depend on the presence of tannic acid, for a solution of gelatine produces no precipitate with the decoction.

Solution of the ammoniacal sulphate of copper produces a beautiful emerald green color both with the infusion and decoction.

Tannic acid added to the decoction of the beans produces a grayish precipitate, which is tannate of strychnia and brucia with coloring matter.

Nitric acid produces with the decoction, first a violet color, which gradually assumes a deep red, and finally changes to a yellow color.

Acetate and sub-acetate of lead cause dense precipitates.

Alcohol also produces a precipitate which is gum.

Ammonia produces a beautiful wine color.

Incineration.—Two hundred grains of the contused beans were incinerated, and yielded twenty-two grains of ashes, in which lime and potassa were detected.

Bassorin.—A small amount of insoluble gum was also detected in the beans.

Albumen.—No albumen could be detected by the requisite tests.

Recapitulation.—From the foregoing experiments the constituents of the beans have been found to be as follows:

Two alkaloids, strychnia and brucia, in combination with igasuric acid, a volatile principle (supposed to be an oil,) a

a large amount of extractive and gummy matter, a small amount of resinous, coloring, and fatty matter, and a trace of bassorin, but no starch or albumen.

ON TINCTURE OF CHLORIDE OF IRON.

By William S. Thompson.

When prepared in accordance with the U. S. Pharmacopœia, this medicament is liable, from various causes, to vary in strength and other properties. It is true, that if the muriatic acid is always of the officinal specific gravity, and the subcarbonate of iron invariable in its proportions of moisture and carbonic acid, the tincture would be of uniform strength, but still an objectionable preparation, in consequence of its tendency to deposit the protochloride of iron, and thus gradually to become weaker.

The proper strength of the acid is that which has the officinal density, for it dissolves the whole of the subcarbonate, with the exception of a slight residue of impurity. An acid of higher specific gravity would render the tincture unduly acid, while one of lower strength would be too feeble to take up all of the iron. It being often difficult, however, to obtain the acid of the exact specific gravity required, I feel prompted to suggest, from my own actual experience, the following means of making the success of the process, as well as the uniform composition and permanence of the product, entirely independent of the strength of the muriatic acid employed.

The subcarbonate of iron, of the shops, seems to consist of a mixture of the carbonate of the protoxide and sesquioxide of iron and water, in variable proportions, depending in a great measure upon its mode of preparation and the manner of drying it. In the U. S. Pharmacopœia it is directed to be dried with a gentle heat, but neither the degree nor the mode of desiccation—whether in an oven or over a water-bath—is stated. It is the custom with some pharmaceutists to dry it in conical-shaped muslin bags, suspended in a current of air at the ordinary temperatures of the atmosphere; and, dried in this manner, it no doubt contains a much larger proportion of moisture and protocarbonate, than when it is dried "with a gentle heat;" by which plan it is sometimes made to nearly resemble the sesquioxide in appearance, and to assume a condition more favorable for preparing the tincture.

I have found from experiment with two samples of subcarbonate of iron made by different manufacturers, that it loses 20 per cent. in weight upon being carefully heated to redness; and the residue is nearly pure, dry sesquioxide. Three drachms of this oxide were mixed with one fluid ounce of muriatic acid of the sp. gr. 1.16, digested at a moderate heat, on a sand bath, filtered, when cold, (through a paper which had been previously weighed,) and washed with three fluid ounces of alcohol. The resulting tincture was of a reddish brown color, without a trace of protochloride, and contains, theoretically, 34 grains of sesquioxide to the fluid ounce; or rather yields that quantity upon precipitation with ammonia. The residue on the filter having been carefully dried was found to weigh 45 grains.

For preparing tincture of the sesquichloride of iron with ordinary muriatic acid, without reference to the strength of the acid employed, I propose the following formula:

Take of	Sesquioxide of Iron, prepared from subcarbonate, heated to redness,	6 oz. Troy.
"	Muriatic Acid,	a sufficient quantity.
"	Alcohol,	3 pints or a sufficient quantity.

The sesquioxide having been placed in a flask or other convenient vessel, one pint of the acid is then added, and the whole left for five or six hours, during which interval it must be occasionally stirred or shaken. It is then gently heated by a sand bath, further additions of acid being made from time to time until all the oxide has been dissolved. When the solution is cool, then add a sufficient quantity of alcohol to make the whole measure four pints, and filter. The filtrate is a clear tincture, which contains, theoretically, 45 grains of sesquioxide to the fluid ounce. This, I believe to be the most simple and effectual plan for preparing tincture of the sesquichloride, so as to insure invariable strength, maximum therapeutic power and insensibility to change.

My *first* experiment in making a tincture of pure sesquichloride of iron was based upon the proportion of sesquioxide obtained from a given quantity of pure crystallized protosulphate, and though forming a more elegant and exact compound, involves much care and labor in the practical details of its preparation. I, however, give the formula, which is as follows:

Take of Pure Crystallized Protosulphate of Iron,		5¼ oz. troy.
"	Muriatic Acid,	a sufficient quantity.
"	Alcohol, commercial, 95 p. c.,	half a pint.

Convert the protosulphate of iron into sesquioxide, in the manner directed in the U. S. Pharmacopœia; having carefully washed it, allow it to settle for at least 24 hours, then draw off with a syphon as much of the water as possible, place the oxide in a glass or porcelain dish, and gradually add muriatic acid until the whole of the oxide is dissolved. The solution at this stage has a ruby red color. Next apply heat to the dish and continue the addition of acid until the liquid assumes a reddish brown color, care being taken not to add an excess, then evaporate the solution to eight fluid ounces, pour in the alcohol and filter. This tincture is weaker in alcohol than that of the Pharmacopœia, and yields upon precipitation with ammonia, 45 grains of dry sesquioxide to the fluid ounce.

Baltimore, May, 1857.

ON FLUID EXTRACT OF UVA URSI.

By John M. Maisch.

A physician desired a liquid preparation of uva ursi which should contain all the active principles of those leaves in a concentrated form. No formula for a fluid extract of uva ursi having as yet been published, I attempted to devise one, and offer the following process, together with the reasons that led to its adoption.

The leaves of uva ursi owe their astringency to tannic and gallic acids; their diuretic properties are principally ascribed to the *ursin* of J. C. C. Hughes, and may partly be due to the salts they contain, which, according to Meissner, consist chiefly of malates and citrates; and their bitterness rests in an extractive matter from which Kawalier separated his *arbutin.* All these substances are soluble in water and alcohol, and are to be obtained in a solution which shall represent the medicinal virtues of the leaves. The crystallized substance, discovered by H. Trommsdorff, (Archiv d. Pharm., lxxx. 273,) to which he has

given the name of *urson*, is insoluble in water, scarcely soluble in ether and alcohol, and without taste or smell; it is probably devoid of any medicinal virtue. From these facts it was inferred that diluted alcohol must be the proper menstruum for exhaustion which would leave behind those comparatively inert substances, gum, resin, fatty matter and chlorophyll. The process I adopted was the following:

Take of	Leaves of Uva Ursi,	℥xvi.
"	Alcohol and water, each	a sufficient quantity.
"	Sugar,	℥xij.

Reduce the leaves to a moderately fine powder, pour upon them ten ounces each of alcohol and water previously mixed, and after macerating for 24 hours, displace slowly with a mixture of three parts of water to one of alcohol until the powder is exhausted. Then evaporate to one pint and strain.

Fluid extract of uva ursi thus prepared, is of a syrupy consistence, specific gravity =1.42, has a reddish brown color, and possesses a strongly astringent and bitter taste; each fluid drachm contains the virtues of sixty grains of the leaves, about an ordinary dose. It was given in a case of chronic catarrh of the bladder with good results, mixed with an equal quantity of fluid extract of buchu, of the strength of half an ounce to the fluid ounce.

Philadelphia, May, 1857.

REMARKS ON THE SO-CALLED IODINE WATER.

North Front street, May 26th, 1857.

PROF. WM. PROCTER, JR.

Dear Sir,—The sample of "iodine water" received from you last week, has since then not changed its composition, being placed in a dark room. The wax stopper is colored brown as far as exposed to the fluid while carrying. To determine the amount of *free* iodine present, I made use both of Dr. F. Mohr's solution of arsenite of soda and of hyposulphite of soda, in combination with starch.

Three portions of five cubic centimetres each, gave the uniform result of 1 *cub. c.* = 0·0001812 gram. of free iodine = 0·01812

per cent. One fluid ounce =480 grains, therefore, contains 0.08697 *of a grain of free iodine.*

To determine the *whole* amount of iodine contained in the liquid, I have applied the method introduced by Bunsen, Dupré and Golfier-Besseyre, founded on the oxidation of iodine-compounds to iodic acid or quinque-chloride of iodine by chlorine. A few drops of chloroform, which assumes a rich rose color from the slightest trace of free iodine, served to indicate the completion of the process. In two portions of 20 *cub. c.* each, I found one *cub. c.* =0·0013405 gram. of iodine = 0·103405 per cent. *One fluid ounce contains* 0·496344 of a grain. Of the whole amount of iodine present, therefore not one sixth is uncombined, the rest being in the form of hydriodic acid.

Your most obedient,

FRED. F. MAYER.

[NOTE BY THE EDITOR.—It will be observed that the above letter corroborates the statements made in our last number, in reference to the condition of the iodine in the so-called "iodine water." Mr. Mayer having a desire to apply the delicate tests indicated, was furnished with a portion of the liquid. His results show a larger amount of combined iodine than we had anticipated to be present, but the total quantity is very nearly that indicated by us. The difference may be attributed to the wax stopper.]

ON CAPSICUM ANNUUM.

By HORACE B. TAYLOR.

(*An Inaugural Essay.*)

This well known plant, from the extensive use made of its fruit as a condiment, as well as in medicine, has been the subject of frequent experiment, with a view to ascertaining its chemical relations. Pereira gives the result of two analyses by Bucholz and Braconnot, and mentions a third by Maurach, in Raspail's work on Organic Chemistry. Reference is made to an active principle obtained by Whilting, besides which, capsicum has been made the subject of unpublished inaugural dissertations. All the chemists I have consulted speak of the active principle as an oil or soft resin; as far as I have ascertained, no organic crystalline principle has hitherto been isolated, though the interesting botanical relations and powerful stimulating properties of the

plant have led to the suspicion of the existence of such a principle. Professor Procter has also made the observation that the so-called capsicin of Bucholz afforded a copious inert precipitate with subacetate of lead, while the remaining liquid on evaporation yielded a powerfully pungent extract. In selecting capsicum for a series of experiments, I have, therefore, confined myself chiefly to the search after a peculiar crystalline principle, and as the sequel will show, not without success. The process by which Bucholz obtained his "acrid soft resin" was by digesting an alcoholic extract in ether and evaporating; by this means the essential oil and crystalline principle were obtained together, and were not easily separable. By reversing the application of these menstrua, and separating the associated inert ingredients with subacetate of lead, and then freeing the solution from lead, the true "capsicin" was obtained. I shall detail only such of my experiments as resulted favorably, and shall do this as briefly as possible.

Experiment 1st.—Five hundred grains of powdered African capsicum were treated with "concentrated" ether by displacement, and exposed to evaporate spontaneously; eighty-eight grains of oleo-resin were obtained. This process was repeated upon a larger quantity, and the semifluid oleo-resin mixed with the first obtained. This was now digested in alcohol of sp. gr. .809 and filtered; the alcohol solution obtained was now treated with subacetate of lead, which threw down a copious precipitate; this was separated by filtration, and the clear alcoholic solution treated with sulphuretted hydrogen, which separated a large amount of sulphuret of lead. After boiling, again filtering and evaporating, it was set away for a day or two, and was found, when examined, to have solidified into a mass of beautiful crystals. A portion of the mass was nearly white, while the remainder was impregnated with the coloring matter of the fruit. In subsequent testings this was found to contain traces of lead, and farther treatment with sulphuretted hydrogen was resorted to. Owing to the comparative insolubility of this gas in alcoholic liquids the entire separation of the metal as sulphuret was difficult. The crop of crystals obtained after further exposure to the gas and to evaporation was less complete, owing, perhaps, to the first having been thrown down at a very low temperature on one

of the coldest days of the present winter; it was solid, consisting of tufts of aggregated acicular crystals much matted together, without any supernatant liquid; the second crop consisted of a few well defined, distinct, acicular crystals, surrounded by an apparently uncrystallizable liquid of a yellowish red color. The crystals were soluble in alcohol, ether, chloroform, oil of turpentine, and caustic potash. Heated on platinum foil they first melt, then take fire, burning with a bright rose-colored flame, and then passing into a dense white vapor, which is very pungent and suffocating. Heated with sulphuric acid they blacken and give off white fumes. Its taste is excessively fiery, inflaming all parts with which it comes in contact. Its odor, though similar to the fruit, is faint.

Experiment 2d.—Two ounces of the same capsicum was treated with alcohol, sp. gr. .835 by displacement, and allowed to evaporate spontaneously; the amount of extract was 271 grains; half of this was treated with ether, which left an insoluble residue resembling gum, which was separated, and found to be soluble in water and to precipitate with subacetate of lead. The ethereal solution was evaporated to the consistence of an extract, then dissolved in alcohol, and the alcoholic solution treated with subacetate of lead, as in the foregoing experiment. This threw down a large precipitate which was separated by filtration, the filtrate was treated several times successively with sulphuretted hydrogen, which separated the lead, filtered as before, and allowed to evaporate spontaneously. The resulting semifluid mass was yellow, with the fiery taste of capsicum, and its characteristic odor combined with that of acetic acid. It was apparently quite uncrystallizable, and volatilized in the form of a white vapor, insupportably pungent and irritating. It was found to be soluble in alcohol, and ammonia added to the alcoholic solution failed to throw down a precipitate. It was insoluble in acetic acid, sp. gr. 1.041; with caustic potash it formed a solution in which an excess of acetic acid produced a yellowish pulverulent precipitate suspended through it.

Experiment 3d.—A portion of powdered capsicum was digested with water in a tin retort, connected with a suitable receiver; to this heat was applied and the distillate carefully collected; it had a pungent taste, with a characteristic, though empyreumatic odor.

On digesting with ether and with chloroform, and evaporating, a pungent, colorless, essential oil was left, though in small quantity. No trace of a crystalline principle was obtained by this process.

Summary.—From the experiments thus obtained, it may be inferred, that the active principles of capsicum are: 1st. A peculiar crystallizable principle, the true *capsicin*. 2d. An essential oil, besides which wax was obtained as a residuary product of experiment first; and a peculiar gum soluble in alcohol and water, and precipitable by subacetate of lead, as a residuum in experiment second; also, fixed oil, which separated from the evaporated ethereal tincture.

ON A NEW PROCESS FOR MAKING LIQUOR FERRI NITRATIS.

By William Procter, Jr.

About five years ago, (see vol. 23d, page 312 of this Journal,) I suggested a modification of the officinal formula for making solution of sesqui-nitrate of iron, which was afterwards adopted in the second edition of the Pharmacopœia of 1851. This modification consisted in the *gradual* addition of the iron to the nitric acid diluted, so as to insure its full per oxidation; and afterwards, to convert any *sub*-nitrate present into *ter*-nitrate, the solution was heated, and NO^5 dropped in, until the proper color of the solution was attained. Now, in this process so much depends on the strength of the nitric acid, and on the last additions of that acid, that in some hands it has failed to prove satisfactory. Even where a permanent solution has resulted, the color varied from a bright sherry-wine color to that of a full reddish-brown. The cause of the deposit, which occurs in the officinal solution as formerly made, is a deficiency of nitric acid; owing to this deficiency, the solution contains both nitrate of the protoxide and sub-nitrate of the sesqui-oxide; a portion of this sub-nitrate is deposited with a portion of sub-nitrate resulting from the action of the air on the proto-nitrate with the formation of ter-sesquinitrate and sub-sesquinitrate. The color of the solution deepens in proportion to the amount of sub-nitrate

formed, and when its color is blackish brown it is due to the presence of a portion of proto-nitrate in addition. In the following process, which is based on that for making the officinal solution of sesquisulphate of iron, (used in preparing hydrated sesqui-oxide,) a nitrate of the protoxide of iron is first made, and then as much nitric acid added to the solution as will convert the protoxide into sesqui-oxide of iron, and this into ter-nitrate. It is as follows:

Take of	Iron wire, (card teeth or small nails,)	three ounces, Troy.
"	Nitric Acid, (sp. gr. 1.42,)	five fluid ounces.
"	Water,	a sufficient quantity.

Mix three fluid ounces of the nitric acid with half a pint of water, and add it gradually in small portions at a time to the iron previously mixed with a pint of water, observing to moderate the reaction by setting the vessel in cold water. In this way the iron is protoxidized at the expense of the water, and hydrogen is evolved without the development of red fumes, which, when they occur, indicate a decomposition of a part of the nitric acid. When all the acid has been added, the solution should be repeatedly agitated with the excess of iron, until on filtering a portion it has a light green color, and with ammonia affords a greenish white precipitate. It is now filtered into a half gallon flask, and the remainder (f.℥ij.) of the nitric acid added, which converts it, with violent effervescence and the escape of red nitrous vapors, into ter-nitrate of sesqui-oxide of iron. The liquid should now be gently heated to deprive it of the absorbed gas, diluted until it measures three pints, and filtered through paper.

Thus prepared, "solution of nitrate of iron" has a pale straw color, a density of 1.098, strong astringent acid taste, affords pure sesqui-oxide on the addition of ammonia, and will keep without any tendency to change. Its appearance is uniform, and in all respects it is a more reliable preparation than the variable one made by the formula of Kerr. It has been used satisfactorily at the Pennsylvania Hospital during the last two months, and possesses the valuable properties appropriate to the officinal solution when well made.

June, 1857.

ON LAPIS CALAMINARIS.

By Ferris Bringhurst, Wilmington, Del.

(Extract from an Inaugural Thesis.)

In going through a course of qualitative analysis last winter, I examined a specimen of calamine obtained from a wholesale druggist of this city, and was surprised at the large amount of sulphate of baryta it contained, and the small yield of zinc, of which I found but a mere trace. This induced me to make an investigation of the matter, the result of which is given in this paper.

In the U. S. Dispensatory, mention is made of the experiments of Mr. Brett, who, some years ago, examined the calamine of the English shops, and found it to contain from 78 to 87.5 per cent. of sulphate of baryta.

According to the Pharmacopœia, calamine is an impure carbonate of zinc, but the results of my experiments have satisfied me that zinc, where it does exist, is in very small proportion, and that a large portion of the lapis calaminaris of our shops, does not contain even a trace of zinc.

* * * * * * *

Analyses.—The following analyses were made in the laboratory of Dr. F. A. Genth, to whom the author is much indebted for his knowledge of chemistry, obtained there during the past two winters.

The last three analyses, though not so complete as the first three, are sufficiently so to answer the object of the investigation.

No. 1, was a sample of calamine from a retail druggist in this city. Its color was a light shade of peach-blossom. Before the blowpipe on charcoal it gave a faint yellow incrustation, and the fused mass, when moistened, blackened silver, evincing the presence of sulphur.

Specific gravity 3.88.

		Pr. ct.
Loss by ignition,		.50
Sesquioxide of Iron,	Fe_2O_3	1.50
Lime,	CaO	2.76
Baryta,	BaO	51.55
Oxide of Lead,	PbO	a trace
Silica,	SiO_3	16.50
Carbonic Acid,	CO_2	a trace
Sulphuric Acid,	SO_3	26.95
		99.76

No. 2, was a specimen from the cabinet of the Philadelphia College of Pharmacy, and the only one of the six specimens examined that contained zinc. It was of a very light brown color, and before the blowpipe gave a yellow incrustation, with a white edge, indicating the presence of lead and zinc.

Specific gravity about 3.9536.

		Pr. ct.
Loss by ignition,		.50
Sesquioxide of Iron,	Fe_2O_3	1.20
Oxide of Lead,	PbO	2.21
Oxide of Zinc,	ZnO	2.00
Lime,	CaO	2.26
Baryta,	BaO	45.07
Silica,	SiO_3	18.00
Sulphuric Acid,	SO_3	28.57
Carbonic Acid,	CO_2	a trace
		99.81

No. 3, a sample from a wholesale druggist of this city, was of a light brown color with a pinkish tint. Before the blowpipe it gave no incrustation, and the mass blackened silver.

Specific gravity about 3.7615.

		Pr. ct.
Loss by ignition,		.00
Sesquioxide of Iron,	Fe_2O_3	1·50
Oxide of Lead,	PbO	a trace
Lime,	CaO	1.40
Baryta,	BaO	62.05
Sulphuric Acid,	SO_3	34.16
Silica,	SiO_3	1.00
Carbonic Acid,	CO_2	a trace
		100.11

No. 4, was obtained from a wholesale druggist of this city. Before the blowpipe it gave no incrustation. Mass blackened silver.

Analysis.—Matter insoluble by long digestion, and subsequent boiling in hydro-chloric acid, consisting chiefly of

		Pr. ct.
Sulphate of Baryta,		95.00
Oxide of Lead,	PbO	a trace
Sesquioxide of Iron,	Fe_2O_3	2.00
Carbonate of Lime,	CaO,CO_2	2.40
		99.50

No. 5, was obtained of a New York importer about fifteen years ago, by a wholesale druggist of this city.

Mat. insoluble in HCl chiefly	.	$BaO\ SO_3$	48.50
Sesquioxide of Iron,	. . .	Fe_2O_3	2.00
Carbonate of Lime,	. . .	$CaO\ CO_2$	49.00
			99.50

No. 6 from a retail druggist of this city, was of a light salmon color. Before the blowpipe it gave a yellow incrustation, and the moistened mass blackened silver.

Portion insoluble in HCl chiefly	.	$BaO\ SO_3$	95.00
Sesquioxide of Iron,	. . .	Fe_2O_3	2.25
Oxide of Lead,	. . . .	PbO	1.00
Carbonate of Lime,	. . .	$CaO\ CO_2$	1.50
			99.75

Conclusion.—This investigation I consider sufficiently extensive to show that much of the Lapis calaminaris of our shops is a worthless and inactive article, not only from the absence of carbonate of zinc, to which it owes, or ought to owe, its value as a remedial agent, but also from the presence of so large a per centage of sulphate of baryta, a totally insoluble and inert salt. In the last revision of our Pharmacopœia, the revisors, in substituting the present Ceratum Zinci Carbonatis for the old Turner's Cerate, (now Ceratum Calaminæ) might very properly have gone a step farther and wholly expunged the latter preparation, for it must be apparent that it has little or no other effect than simple cerate, and is consequently a superfluous article in our officinal standard.

Philadelphia, Feb. 20th 1857.

GLEANINGS—CHEMICAL, PHARMACEUTICAL AND MEDICAL.

Preparation of Ferris Pulvis.—Hr. Zängerle suggests that this article can be made by igniting 5 parts of protoxide of iron, 6 parts of anhydrous ferrocyanide of potassium, and 1¾ parts of anhydrous carbonate of potassa; the ignition is maintained until the evolution of gas ceases. The fused mass, on cooling, is thoroughly washed with pure water, and the residue dried. The product is a dark gray powder, which is metallic iron in a state

so finely divided as to burn throughout when any part is touched with a lighted match.—*Pharm. Jour.*, *May*, 1857.

Preparation of pure grape sugar.—Commercial honey, as crystalline as possible, is spread on porous tiles. The white crystalline residue is dissolved in alcohol and purified by recrystallization; if necessary, also with animal charcoal. The honey yields about one-fourth of its weight of grape sugar.—*Chem. Gaz.*, March 2d, 1857.

Lactic acid in the vegetable kingdom.—Prof. Wittstein announces (to the meeting of German Naturalists in Sept., 1856,) the discovery of lactic acid in vegetables, especially in the peduncles of *Solanum dulcamara*, and in the liquid which dropped from freshly cut vine branches. He likewise mentioned that he had obtained salicylous acid (oil of Spiræa ulmaria,) by distilling the buds of *Populus balsamifera.*—*Chem. Gaz.*, Mar. 2d, 1857.

Preparation of Alizarine ink.—Hr. Leonhardi, of Hanover, has patented a process for making this ink. 24 parts of Aleppo galls and 3 parts of Dutch madder are digested with 120 parts of warm water. The solution formed is filtered, and mixed with 1.2 parts of solution of indigo, 5·2 parts sulphate of iron, and 2 parts crude acetate of iron solution. The alleged advantages of this ink are, that 1st. It does not contain gum. 2d. The tannate of iron is prevented from separating by the sulphate of indigo. 3d. Mouldiness is prevented by this addition, and by the acetate of iron.—*Pharm. Jour.*, Jan., 1857.

Coloring principle of garden Bergamot flowers.—M. Belhome states that the flowers of Monarda didyma contain the same coloring principle as the fruit of the nopal and cochineal, and that they may be used with advantage for the preparation of carmine. —*Pharm. Jour.*, March, 1857.

Preparation of matches.—Prof. Wagner states that phosphorus matches should not have more than one-tenth of phosphorus, and considers that too large a proportion is often used. The following proportions are recommended, viz.: 8 parts of phosphorus dissolved in bisulphuret of carbon, 21 parts of gelatin, 24 parts of peroxide of lead, and 24 parts of nitre. He considers that the binoxide of manganese would be the best adapted to the preparation of the paste, since it contains a larger amount of oxygen than red lead or peroxide of lead, and as the metallic oxide serves only

to maintain combustion by yielding oxygen. The nitre also is supposed to be serviceable only as a source of oxygen, and might, therefore, be replaced by some other nitrate, for instance nitrate of baryta, which, like the potash salt, is anhydrous.

The amorphous phosphorus does not seem to be nearly so good for the preparation of matches as ordinary phosphorus, most likely in consequence of the necessity for its re-conversion into ordinary phosphorus before ignition takes place.—*Pharm. Jour.*, Feb., 1857.

Fluorine in the blood.—M. J. Nickles has not only found this element in human blood, but likewise in that of other mammalia, as the pig, sheep, ox and dog, and in that of many birds, as turkeys, geese, ducks and chickens. These results give fluorine an importance, not hitherto accorded to it, in physiology, and disprove the opinion of Berzelius that the presence of fluorine in bones is accidental and unnecessary.

To yet further prove the reality of this element being a normal constituent of the animal body, M. Nickles has found it in the bile, in the albumen of egg, in gelatin, in saliva, in urine, in the hair, and in fact, in the entire organism.—*Comptes Rendus.*

Oil of peppermint.—According to the Druggist's Circular, (April, 1857, page 35,) oil of peppermint was manufactured in St. Joseph's County, Michigan, in the year 1855, to the extent of 25,000 pounds, valued in New York at three dollars per pound. From 8 to 12 pounds is the product of an acre. The first crop requires a good deal of care, but the two following years the plant requires but little attention. The mint is cut and distilled in August. If this statement is correct, between two and three thousand acres are devoted to peppermint. According to Mr. Bell, (Pharm. Jour., Jan., 1851,) an acre of peppermint at Mitcham produces on the average five tons of the green cut herb, which by distillation affords 3½ ℔. of oil per ton, making 17½ ℔. per acre, a larger yield than that obtained in Michigan.

Oil of turpentine as a cure for itch.—Dr. Anselmier (*Jour. de Chim. Med.*, Dec., 1856,) says that of the various methods of treating itch none has been more successful or cheaper than that by essence of turpentine. The following is the mode of using: The patient, on going to bed, sprinkles on the sheets, and his

usual daily clothes, about 50 grammes (14 fluid drachms) of oil of turpentine; when he awakes he is cured; his bed and his clothes are no longer infected. The odor of the turpentine passes off in two or three days.

This treatment has several advantages; 1st, it attacks the parasites at the time they are most accessible; 2d, fumigation acting by substitution on secondary eruptions is much less irritating than lotions and frictions, whether soapy, sulphuretted, or terebinthinated; 3d, the treatment acts at the same time on all the contaminated objects; 4th, not only is it more rapidly efficacious and better than any other, it is likewise the cheapest. —*Chemist*, Jan., 1857.

Glycerin and wood soot in chronic eczema.—M. Bougard, after trying various applications in an aggravated case of chronic eczema, resorted to a mixture of soot and glycerin in equal parts with astonishing effect. Fifteen days' use of this remedy had almost cured the eczema, which was of several years standing. This result was corroborated by subsequent successful treatment of cases of eczema.—*Jour. de Med. de Bruxelles*, Sept., 1856, *in Chemist.*

Glycerin and borax in cracked tongue.—Dr. Brinton says that two samples of borax dissolved in four ounces of water with an ounce of glycerine (Price's) gave marked relief at once, and eventually cured, aided by other treatment, an obstinate case of cracked tongue.—*Lancet in South. Med. and Surg. Jour.*

Poisonous principle of Cyclamen Europæum.—M. De Luca has discovered in this plant a proximate principle which he calls *cyclamin*, and which appears to possess poisonous properties analogous, though in a less degree, to those of the curara of South America. Cyclamin is white, opaque, brittle, inodorous, hygroscopic, and is darkened by exposure to the light. Pigs eat it with impunity, but a drachm of the juice thrown into the trachea of a rabbit caused it to die in convulsions in ten minutes. Bromine appears to possess antidotal powers.

Tinctura Rosæ.—The following formula, attributed to Mr. Squire, is given in the new (1857) edition of Redwood's Supplement to the Pharmacopœia:

Take of rose petals, bruised, 5 ounces; proof spirit, made with rose-water, a pint. Digest for three days, frequently shaking,

and press off. Digest the mass with half a pint of proof spirit for three days, press off, and mix the two liquids to form the tincture for use.

Corn leaves in fever.—Dr. Greenville Dowell, of Texas, states in a letter to the Memphis Recorder, that an infusion of the leaves of Indian corn (Zea mays) possesses an anti-periodic power, and is used in febrile diseases in some parts of the South. The Doctor recommends a concentrated tincture given with quinia (!) in minim doses. The tincture is made with half a pound of dried corn leaves to a gallon of alcohol, macerated two weeks and then after filtering reduced to a pint by evaporation. Any anti-periodic requiring the *aid* of quinine deserves not to be relied upon.

Silicate and Benzoate of Soda in gout and rheumatism.—Dr. M. Dowler, of New Orleans, has given a condensed account of a course of medication pursued by Drs. Socquet and Bonjean, of France, (*Jour. de Conn. Med. Chir.*, Oct., 1856) in gout, rheumatism and allied diseases, in which these salts are the chief agents used, and which he calls *dialytic* preparations. Their *Silicate of Soda* is made by infusing one part of pure silica and two of dried carbonate of soda, mixed in powder, in an earthen crucible, and pouring out the silicate on a stone slab to cool. This is then pulverized and treated with boiling water, which only partially dissolves it. The filtered and concentrated liquor allows the salt to be precipitated in an imperfectly crystallized state. This is again dissolved in water at 100° F., filtered and by concentration affords the silicate of soda in the desired state.

Benzoate of Soda is easily prepared by saturating benzoic acid with crystallized carb. soda in hot water, concentrating and crystallizing.

The following is their formula for *dialytic pills*:—

℞. Silicate of soda 375 grs.; Hydro-alcoholic extract of Colchicum 240 grs.; Extract of Aconitum napellus one ounce; Benzoate of soda one ounce and a half; medicinal soap one ounce; make into a mass and divide into 1000 pills and dry them well. The dose begins with one daily and increased to three or four daily, one-half in the morning the other at night.

The *dialytic syrup* is made thus:—

℞. Silicate of soda 18 oz.; benzoate of soda 9 oz.; syrup of

gum 322 oz. Dissolve the benzoate and silicate separately in a sufficient quantity of hot water, filter and mix the two solutions with the syrup, and then concentrate by boiling. Dose from one to two dessert spoonfuls in a glass of depurative ptisane (infusion of Dulcamara liquorice, &c.)

Accompanying these internal remedies an external treatment with liniments is directed, and the following formulæ given for making them :—

Bituminous Dialytic Liniment.—℞. Pure naptha ℥iiss ; narcotic oil ℥ss ; volatile oil of turpentine ʒiss ; mix, agitate occasionally, and after repose filter. The *narcotic oil* above called for is made as follows : Take of dried leaves of belladonna, aconite, tobacco, cicuta, and stramonium of each 3 oz.; olive oil 156 ounces. Coarsely powder the leaves, moisten with warm water to form a thick paste. After twenty-four hours' contact add the oil, digest the mixture for eight hours with frequent agitation, then press and strain. This oil has a fine green color.

Etherated Dialytic Liniment.—℞. Acetic ether ℥iiss ; alcoholic tincture of aconite ℥ss ; tincture of arnica root grs. lxxv. ; mix and filter. These liniments are used as frictions, or they may be applied to the part on a compress.

Those wishing to read the medical theory and treatment of the authors will find it in the New Orleans Medical and Surgical Journal, and in the Western Lancet for June, 1857, page 455.

Vanilla.—Vanilla was imported into the United States last year to the extent of 5,000 pounds, at a cost of $100,000, which make its wholesale cost $20 per ℔. The duty on this amount, $20,000, goes into the U. S. Treasury. It seems strange that so valuable a product should not be more extensively produced than it appears to be. Why cannot the vanilla plant, which grows vigorously in our hot-houses, be cultivated in Texas and Florida ?

Dr. Simpson's Morphia Suppositories.—Take of acetate of morphia six grains ; sugar of milk a drachm ; simple cerate half a drachm, or as much as may be sufficient to give proper consistence, and divide the mass into twelve suppositories. Each suppository held on the point of a needle is then dipped into a mixture of one part white wax and two of cerate, previously melted. This should be quickly done, and the melted cerate not too hot.

GLEANINGS.—TOXICOLOGICAL.

Death by Laudanum.—At Stalybridge, Eng., a druggist named John Lees, was brought before a coroner's jury for causing the death of a girl of 15 years old, by selling laudanum for tincture of rhubarb in a *cup without a label.* The jury gave a verdict in accordance with the facts without indicting the druggist.—*Pharm. Journ.* Sept., 1856.

Poisoning by Arsenic with intent to kill.—At the South Lancashire (Eng.) Assizes, Aug. 19, 1856, Jane Newton was tried for administering half an ounce of arsenic to her husband. The arsenic was obtained on the plea of use for vermin. The arsenic was obtained of an apothecary whose assistant testified that "he remembered three females coming in for mercury to kill vermin;" he said, "I supplied them with arsenic—arsenic and mercury are the same—Mr. Waterhouse was there, he received the money. He did not know who it was that came in for arsenic." In answer to the judge he said "a tea-spoonful of arsenic will kill a person." The medical evidence was conclusive as to the arsenic being taken by the husband. The jury rendered a verdict of "not guilty."—*Pharm. Journ.* Sept., 1856.

Poisoning by Antimony.—Betsy McMullen was tried at Liverpool, Aug. 22d, before Justice Willes, for the murder of her husband at Bolton, on the 2d of July last, by repeated small doses of antimony. It appears from the evidence that the husband was in the habit of excessive drinking, and that the wife administered the tartar emetic to him ostensibly for the purpose of correcting this habit. The medical evidence proved beyond doubt that death was caused by that substance. A servant testified to the frequent clandestine administration of a white powder, a part of which she obtained and sent to the family physician. The following testimony of the druggist shows the source of the poison. "*J. Rowland Simpson*, druggist, said he was in the habit of selling emetic powders composed of tartarized antimony and cream of tartar. The powders were sold at one penny each, and he usually cautioned the purchaser to be careful with it, and to divide each powder into four doses. They are called 'quietners.' He did not remember that men ever

purchased them, but they were scarcely ever asked for except by women whose husbands have been on the 'spree,' and are given to cause sickness and to throw up the dregs of the drink." The jury brought in a verdict of *guilty* of manslaughter. The judge before pronouncing sentence cautioned druggists against this practice, and believed that they were equally guilty of manslaughter.

Poisoning by Strychnia.—Jane Dyer came to her death at the General Hospital, St. Heliers, Jersey, on the 30th of August, 1856, from taking four pills containing strychnia, which had been clandestinely taken from the Surgery by an attendant in ignorance of their nature. The poison was detected on *post-mortem* examination.—*Pharm. Journ.*, Oct., 1856.

Poisoning by Black Drop.—On the 11th of Sept., (1856,) Augustus Broughton, son of Colonel Broughton, living near Weymouth, [Eng.] complained of headache, Mrs. Broughton accordingly wrote to Mr. Barling, chemist, as follows: "Please send an aperient draught for a child eleven years of age." Mr. Barling being absent, the note was given to one of his apprentices, John Lundie, aged 20, who told James Barrett, a lad of 13, to fill the bottle with "black draught," instead of which he filled it with "black drop" and gave it to Lundie, who labelled it "black draught" and gave it to Mrs. Broughton's maid. At 9 o'clock the fatal dose was given by the hands of the mother, and the patient became comatose and soon after died. Verdict of the coroner's jury was in accordance with the facts. —*Pharm. Journ.*, Oct., 1856.

[From the evidence, Lundie appears to have been thoroughly qualified and the store in good standing, the mistake having occurred from Lundie's delegating to a beginner what he should have done himself.—Ed.]

Poisoning by Sulphuric Acid.—A female child, nine days old, daughter of Thomas and Elizabeth Brennan, of Runcorn, near Liverpool, came to its death by the corrosive action of sulphuric acid (as ascertained by *post-mortem* examination) administered by its parents, who, with a young man resident in the family, were committed on the charge of "wilful murder."—*Pharm. Journ.*, Nov.

Poisoning by Oil of Bitter Almonds.—Two instances of

suicide by taking in each case about half an ounce of oil of bitter almonds have occurred in England. No mitigation of the symptoms resulted from treatment.

Poisoning by Belladonna.—A Frenchman, aged 35 years, took, with suicidal intent, a small lump of Menier's extract of belladonna. In an hour his courage failed, a physician was sent for who found him powerless, pupils dilated, extremities clammy and ice cold, pulse slow and full, face colorless, with indications of great fear. His feet and legs were put in a strong mustard bath, and ten grains of sulphate of zinc given in warm water every minute, until four doses had been taken without effect, when emesis was produced by a teaspoonful of mustard in a tumbler of water. He slowly recovered.—*Pharm. Journ.*

Poisoning by Prussic Acid.—On Thursday, Dec. 30, an inquest was held over the body of Wm. Marcooly, who came to his death suddenly on the 27th by taking what had been sold as castor oil. On investigating the occurrence it appeared that the assistant of Mr. Budd the chemist, was engaged putting up a prescription for a lotion containing a drachm of Scheele's prussic acid at the time the oil was called for, and by some singular aberration the poison was put in the oil instead of the lotion, and thus caused the death of Macrooly. Mr. *Justice Wightman* in summing up said, that to justify a verdict of manslaughter it must be clearly made out that the act was not a mere mistake, such as every one was liable to, but that it was the result of some gross negligence on the part of the accused person. After an hour's absence, the jury returned a verdict of "*not guilty*," with an expression of reprobation of the careless manner in which poisons were generally dispensed.—*Ibid.* March, 1857.

Suicide by Strychnia.—William Gummow, of Newport, (Eng.) sent his servant to a druggist for arsenic to kill rats. The druggist, who gave the messenger three grains of strychnia instead of arsenic, said on his examination, "I have sold the same for killing rats for four or five years to many persons; I write the word poison on my packages and have not a printed label." The deceased took the whole of the strychnia, and despite the medical treatment died after several hours of distressing spasmodic suffering.—*Times*, Feb. 18, 1857.

Poisoning by the Root of Water Hemlock, (Cicuta virosa).—Two young men, farm laborers at West Boldon, Sunderland, (Eng.) were engaged in cleaning a hedge and ditch, during which they ate of the root of water hemlock without suspecting its nature, and were found paralyzed and speechless near the ditch. Medical aid was summoned, but they expired shortly after removal to a house. Portions of the root of Cicuta were found near with teeth marks on them, and a root in the pocket of one of the laborers.—*Ibid.*

Accidental Poisoning by Arsenic.—On the 16th of March last, the Rev. James Alexander, LL. D., Rector of Tessauran, Kings county, Ireland, who was just convalescent from illness, sent to the shop of Edward Whitfield, in Ferbane, for a pound of arrow root. Denis Grogan, shopman, finding the shop jar did not contain sufficient, made up the weight from an unlabelled bundle of a white powder. The arrow root was prepared and partaken of by Dr. Alexander, his daughter and two servants. The daughter noticing a peculiar taste in the jelly, at once suspected poison, sent for a physician and immediately administered mustard emetics to her father and herself. Dr. Alexander died on the 1st of April; the others recovered. From the investigation before the magistrates it appears that Whitfield is a grocer, who is in the habit of selling poisons and some medicines used by farmers, and since the accident, rice, jalap, corrosive sublimate and oxalic acid were found in different papers in the same drawer, and all under the care of an ignorant boy. Grogan was required to give bail after a coroner's verdict in accordance with the facts.—*Pharm. Journ.* May, 1857.

Poisoning by Ammonia.—James Thompson, of Halifax, Eng., during a depressed state of mind attempted to drink a wineglassful of solution of ammonia, but was prevented by a servant. Soon afterwards he stealthily possessed himself of the bottle, which had been locked up, and drank a large draught, from which he expired in fifteen minutes. Verdict accordingly.—*Manchester Guardian and Pharm. Journ.*

Poisoning by Radix Belladonnæ.—Two persons, a father and son, were poisoned at Dudley, England, by taking a decoction of fresh root of belladonna, used accidentally for comfrey;

after very violent symptoms in the son, involving the eyes and brain, and less marked in the parent, both recovered. About 2 oz. of root was decocted.—*Pharm. Journ.*, May.

Poisoning by Strychnia.—Recovery.—Dr. Hodgetts, of West Bromwich, Canada, describes a case of accidental poisoning by strychnia. A policeman took *four* grains of strychnia, used by him for killing dogs, instead of an opiate powder. He immediately discovered his mistake, ran to a physician and procured an emetic. Dr. Bly arrived in 20 minutes, two other emetics having been given meanwhile without effect. The Doctor found the patient in violent tetanic spasms and his jaws firmly locked, with inability to swallow. Dr. Bly applied chloroform, which relieved the spasms in three minutes and stopped them completely in ten minutes, when a third powerful emetic was given which vomited in ten minutes after. Repeated quantities of warm water were given and thrown off the stomach until all the poison remaining in that organ was removed. The spasmodic symptoms were controlled by the chloroform administered at intervals, until they ceased and the patient was out of danger. The patient retained his consciousness throughout, and in twenty-four hours was pretty well recovered.—*Ibid.*

Poisoning by Sulphate of Potassa.—Elizabeth Gaylor, aged 80 years, died from the effects of a large quantity of sulphate of potassa, purchased by the husband at the wife's request, as he alleges. Dr. Letheby analyzed the contents of the stomach and found sulphate of potassa in it, and from other circumstances and evidence believed deceased had taken an ounce and a half.

The jury returned a verdict of wilful murder against William Gaylor, who was committed.

Poisoning by Opium.—A man named Bury was committed for trial at Worcester, for poisoning three witnesses by mixing opium in the beer with which he treated them. A timely use of emetics saved them from its ill effects.

ON CONHYDRINE, A NEW ALKALOID FROM CONIUM MACULATUM.

By Prof. T. Wertheim.

If the fresh flowers of *Conium maculatum* be extracted with hot water containing sulphuric acid, and the moderately-concentrated extract, after supersaturation with caustic lime or potash, be submitted to as rapid a distillation as possible, a strongly alkaline distillate is obtained, which, besides ammonia and coniine, contains a hitherto undescribed organic base. It is obtained in the pure state in the following way.

The alkaline distillate is neutralized with sulphuric acid, the fluid evaporated on the water-bath to the strongest syrupy consistence, the residue extracted with very highly rectified alcohol, and the alcoholic solution separated by filtration from the deposited sulphate of ammonia. After the alcohol added has been distilled off in the water-bath, the residue is gradually mixed, with continual refrigeration, with a considerable excess of the most concentrated solution of potash; the mixture, when completely cold, is then brought in contact with a sufficient quantity of pure ether, and left so for a long time with frequent agitation; the ethereal solution, which is of a yellowish or brownish-red color, is drawn off from the potash solution beneath it, and the ether distilled off as completely as possible in a glass retort on the water-bath; the remaining fluid is afterwards put into a tubulated retort of smaller dimensions, and the distillation continued on the oil-bath in a current of hydrogen gas, the heat being very gradually increased. In this way oleaginous coniine first distils over, contaminated at the commencement with a little ether and water, but afterwards far purer and perfectly colorless; but when the heat is gradually raised, the retort becomes filled with beautiful, colorless, splendidly-iridescent, crystalline laminæ, which appeared in one case at 302° F., in another at 374° F., and in a third only at 410° F. They appear sooner the more slowly the preliminary stage of the distillation is conducted. In the first case this was done very slowly, so that the coniine was evaporated at the lowest possible temperature.

Of course, in this mode of preparation, a considerable contamination with coniine cannot be avoided. But the greater part of

this may be easily got rid of merely by pressing the crystals; for this purpose the sublimed crystalline crust is detached from the neck of the retort, and put into a glass vessel which is immersed in a freezing mixture; by this means the crystals are rendered more compact, whilst at the same time their mass increases, because the coniine passing over with them contains a considerable quantity of the substance in solution; they are then pressed strongly between Swedish filtering-paper, and finally purified completely by repeated recrystallization from ether. The substance thus purified, when completely dried under the air-pump, forms perfectly colorless, nacreous, iridescent, crytalline laminæ, of a coniine-like odor. Five Vienna hundredweights =280 kilogrms. of freshly collected flowers, when treated as above described, gave 17 grms. of pure crystals; but even perfectly ripe seeds furnished it in considerable quantity together with the ordinary coniine, and it must be left undecided for the present whether the quantity in the ripe seeds is essentially less than in the fresh flowers. The latter were collected in the immediate vicinity of Pesth and Ofen, and the ripe seeds in the neighborhood of Stuhlweissenburg.

The investigation of this crystallized substance furnished the following facts. It fuses when slightly heated, and may be gradually sublimed even below 212° F. At higher temperatures it volatilizes rapidly and without residue, diffusing to great distances the peculiar odor of coniine, or one very nearly allied to it. It is tolerably soluble in water, and readily soluble in ether and alcohol; the solution has a strong alkaline reaction. Even at the ordinary temperature it expels ammonia from its compounds, but it appears to be separated from its salts by coniine; its aqueous, alcoholic, or ethereal solution, neutralized with muriatic acid, furnished no crystals either by slow or rapid evaporation; but when the alcoholic solution, neutralized with muriatic acid, was mixed with alcoholic solution of perchloride of platinum, taking care that the latter should not be in excess, and this mixture was left first of all *in vacuo* over sulphuric acid, and as soon as crystals began to be formed at the edge, placed to evaporate in the air, remarkably beautiful, large, hyacinth-red crystals were obtained, which were determined by Prof. Peters.

The forms of this platinum-salt belong to the dimetric system; it gave on analysis—

C	27·59	27·34	27·80	16	27·47
H	5·30	5·48	5·16	17	5·15
N	4·55	..	..	1	4·01
Pt	27·95	27·99	28·04	1	28·33
Cl	..	..	..	3	30·47
O	..	..	..	2	4·57

The base which is contained in this platinum-salt consequently has the formula $C^{16} H^{17} NO^2$. Thus we have

Coniine .... $C^{16} H^{15} N$

New base........ $C^{16} H^{15} N, H^2 O^2$.

The latter therefore only differs from coniine by the elements of water, for which reason the author calls the new base *conhydrine.*

By distillation with anhydrous phosphoric acid, it loses this elementary group of 2 equivs. water, and furnishes coniine, which is exactly similar to the ordinary coniine in all its properties, and even in its action upon the animal organism; whilst conhydrine certainly produces the same phenomena of poisoning, but in a far weaker degree.

The author takes the opportunity of making the following observation upon the muriate of coniine. In the chemical handbooks it is stated that muriate of coniine crystallizes with difficulty, and that the crystals are deliquescent; this, however, is by no means the case; any quantity, however small, of coniine, brought in contact with muriatic acid upon a watch-glass, furnishes a corresponding quantity of crystals in a very short time; these crystals are not in the least deliquescent, and when a rather large quantity is prepared, they are easily obtained very regular in form and of considerable size. The crystals are rhombic, and have the formula $C^{16} H^{15} N, HCl$.

Between coniine and conhydrine we find a connexion which renders it interesting to compare these two bases with quinine and Wittstein's new base cinchonidine.

Thus if ordinary quinine $= C^{20} H^{12} NO^2$ be treated with anhydrous phosphoric acid, phosphate of quinoiline and a gas are obtained; the gas is absorbed in small quantity by water, burns with a pale yellow color, and is taken up in very large quantity

by sulphuric acid, in the manner of the gaseous hydrocarbons, which are prepared from the alcohols by the elimination of water. This decomposition may therefore probably be represented by the following equation:—

$$C^{20}H^{12}NO^2 + PO^5 = PO^5, HO, C^{18}H^8N + (C^2H^2).$$

Wittstein's cinchonidine has the formula $C^{18}H^{10}NO^2$, and is consequently to be regarded as a homologue of ordinary quinine less C^2H^2.

The result of the action of anhydrous phosphoric acid upon this quinine may, however, almost be predicted with certainty from the above premises; the reaction will evidently take place in accordance with the equation

$$C^{18}H^{10}NO^2 + PO^5 = PO^5, HO, HO, C^{18}H^8N,$$

and will therefore present the most complete analogy with the similar reaction of conhydrine.—*Chem. Gaz. March* 16, 1857, *from Sitzungsber. der Akad. der Wiss. zu Wien.*

ON THE RELATIVE ACTIVITY OF THE DRIED CORMUS AND SEED OF COLCHICUM.

By Prof. K. Schroff.

Former experiments made by the author, with the fresh bulb and the bruised seeds, did not confirm the general belief of the seeds containing more virtue than the bulb; he therefore made another series of experiments, but now with the pulverized seed and the dried bulbs, (over two years old;) also with colchicine, prepared by Mr. Merk, of Darmstadt.

The experiments were made on full grown rabbits, and led the author to the following conclusions:

1. The activity of the seeds is inferior to that of the dried bulbs, dug in the fall.

2. The cormus obtained in the fall, and dried simply by exposure to the sun and air, loses nothing of its activity either by this drying process or by keeping; the active principles are neither volatilized, destroyed nor decomposed. 130 grains of the dried bulb killed a rabbit on the first day; while of the fresh bulb, 130 grains on the first, and 170 grains on the second day, were required to kill a rabbit in from two to five days. The fresh

bulb is less active on account of the large amount of water it contains, which is driven off during exsiccation. In all these cases of poisoning, the symptoms before and after death were alike.

3. The dried, as well as the fresh bulb, dug in summer, is much less active than the fall root.

4. The exsiccation by the heat of the sun in the open air, is preferable to any other mode of drying, (slicing transversely, immersing in boiling water, cutting out of the new offset, &c.)

5. Good bulbs are not injured by keeping for several years. Of course, they must have not been eaten by insects or otherwise altered.

6. The symptoms of poisoning by the fresh and dried bulbs being alike with those produced by colchicine, this principle is to be regarded as the really active principle, though up to the present time it has not been prepared yet from the bulb. Pelletier and Caventou discovered, in 1819, gallate of veratria in the cormus of colchicum, but Geiger and Hesse showed, in 1833, that this must be a mistake, as they had discovered in the seeds a principle different from veratria to which they gave the name of colchicine.

As yet, there have been no experiments made for comparing the relative activity of the bulb and seeds. The mistake of the latter being stronger than the former may have originated in the fact that most of the poisoning cases occur with the seeds and their preparations, and that the bulb varies in its activity with the state of its maturity; that during spring and summer, according to the author's former investigations, it contains the active principle in very small proportions, and consquently exhibits little or no toxicating properties.—*Oester. Zeitschr. f. pract. Heilkunde,* 1856, *No.* 22–24, *and Buchner's N. Repert.* 1856, 437–444. J. M. M.

ON THE DETECTION OF THE ADULTERATION OF ESSENTIAL OILS, ESPECIALLY WITH OIL OF TURPENTINE.

By G. S. Heppe.

It is remarkable that well-dried nitroprusside of copper behaves in a very characteristic manner towards oil of turpentine and

some other oils, so that this reagent may serve for the detection of oils free from oxygen, especially oil of turpentine, in those which contain oxygen. Turpentine cannot be detected by this means in oils which are themselves free from oxygen, such as oil of lemons, oil of orange, or oil of juniper.

A fragment of nitroprusside of copper, of the size of a pin's head, is brought in contact with a small quantity of the oil to be tested in a test-tube; it is heated until the oil begins to boil, kept boiling only for a few seconds, and then allowed to settle. If the oil be an oxygenated oil free from turpentine, the nitroprusside of copper becomes black, brown or gray, and the supernatant oil changes its color and usually appears darker. If the oil contains turpentine, the deposit is of a fine green, or bluish-green, and the supernatant oil colorless or slightly yellow.

The above-mentioned conditions must be exactly observed. If necessary the lens must be employed to ascertain the changes of color, for even the color of nitroprusside of copper treated with oil of turpentine is different and more intense than its original color. Sometimes also it is advisable to make experiments with pure oil.

Of the oils free from oxygen the author investigated the following, and found their action the same as above described, even when the boiling was continued longer; it was only in No. 7 *a* and *e* that the oil became darker, but the deposit was of a more intense green.

1. Petroleum, crude and rectified; 2. Oil of bitter oranges; 3. Oil of sweet oranges; 4. Oil of orange flowers; 5. Oil of juniper berries; 6. Oil of savin; and 7. Oil of turpentine: *a*, crude German; *b*, crude French; *c*, rectified French; *d*, German rectified over lime; and *e*, very old, rectified French, which had become thick.

The oils containing oxygen behave similarly in general, but even here small differences occur. Of the oils from the *Umbelliferæ* the author tested,—

1. *Oleum Carui*, prepared from the seeds and from the stalks, pure and mixed with oil of turpentine. The pure oil, when boiled with the reagent, rapidly became turbid; the precipitate was deposited with difficulty; the change of color was more distinct the longer the boiling, and the older the oil. An addition

of oil of turpentine entirely prevented the decomposition, but it must not be boiled too long, as oil of turpentine is more volatile than the other essential oils.

The oil from the stalks, which is of a less agreeable odor, behaved when pure exactly like the oil of the seeds. Nearly all the samples obtained from different manufactories contained oil of turpentine.

2. *Oleum Fœniculi.*—The reagent became first dark green and then black; with a very small quantity of the reagent the oil became brownish-yellow, with a larger quantity reddish-brown. In this case the author believes that 20 to 22 parts of oil decompose 1 part of the reagent. The addition of oil of turpentine prevented the decomposition.

3. *Oleum Anethi,* and 4. *Oleum Anisi semin.* exhibit the reaction very rapidly; weaker when 1 part of the nitroprusside of copper is acted upon by 1000 parts than by 100 parts of the oil: the deposit is black.

5. *Oleum Cumini semin.* became brownish-yellow with the first, and dark yellowish-brown with the second proportion: the deposit was only ashy-grey.

Of the oils of the *Labiatæ,* the author examined,—

6. *Oleum Lavandulæ.*—It furnished a slate-grey deposit. The color of the oil became darker according to the quantity of the reagent.

Also 7. *Oleum Menthæ pip.;* 8. *Oleum Menthæ crisp.;* 9. *Oleum Melissæ;* 10. *Oleum Majoranæ;* 11. *Oleum Salviæ;* 12. *Oleum Serpylli.* They behaved in general like *Oleum lavandulæ.* With some the deposit was quite black; with others brown or greyish-black. An addition of oil of turpentine prevented the change of color.

Of the oils of the *Compositæ,* there were tested,—

13. *Oleum Absinthii;* 14. *Oleum Cynæ;* 15. *Oleum Millefolii flor.;* and 16. *Oleum Tanaceti.* With these the deposit was rather brownish-black, and only pure black with *Oleum Cynæ.* The beautiful blue color of the *Oleum Absinthii* became first pale blue, and then dark green.

The author also examined the following oils from the *Myrtaceæ:*—

17. *Oleum Cajeputi*, the green color of which became brownish-yellow; the deposit was black.

18. *Oleum Caryophyllorum.*—The crude and rectified oils were boiled with the reagent; the color of the oil became violet and cherry-red, and the deposit was slate-grey. Even $\frac{1}{2000}$ of the reagent produced a rose color. Oil of turpentine also prevents the action, when it is not entirely driven off by too strong a heat.

From the *Laurineæ*, 19. *Oleum Cassiæ* and 20. *Oleum Sassafras*, were treated in the same way: in both the reagent became black, the color of the oil was rendered darker; the reagent became opake, and the oil separated into two strata.

21. The *Oleum Anisi stellati* of the family *Magnoliaceæ* also gave a black precipitate: 22. *Oleum Valerianæ* (*Valerianaceæ*) behaved in the same way. Of the *Rutaceæ* only 23, the *Oleum Rutæ graveol.* was tested; the deposit was ash-grey; the oil was pale yellow and became brownish-yellow.

24. *Oleum Bergamottæ*, of the family *Hesperideæ*, when pure gave an ashy-grey deposit and acquired a darker color. The addition of oil of lemons entirely prevented the reaction.

Of the *Monocotyledones*, only 25, the *Oleum Calami radicis* was tested: it furnished a slate-grey or black deposit, and became dark reddish-brown.

Oleum Sinapis and *Oleum Amygdalarum amar.*, of which the author thinks it questionable whether they are to be reckoned among the essential oils, behave towards the reagent in the same way as the oils free from oxygen; the color of the nitroprusside of copper becomes a beautiful dark green.

The chemical nature of the changes produced by this reagent could not be ascertained with certainty.—*Chem. Gaz. April* 15, 1857, *from Zeitch. für Pharm.* 1855, *and Archiv der Pharm.*

NOTE ON SOLANINE, AND ITS DERIVATIONS.

By M. A. Moitessier.

The divergence of the results obtained by the different chemists who have made analyses of solanine has led us to resume the study of this alkaloïd, and to give here the result of an investiga-

tion which we made at the Faculty of Sciences of Montpellier in the laboratory of Professor Chancel.

Several species of the genus *Solanum* (S. *nigrum*, S. *dulcamara*, S. *tuberosum*, *&c.*,) furnish alkaloïds, which are generally considered as identical; we have not yet been able to compare these various substances analytically, but we may affirm that in their physical characters they differ perceptibly from each other, and in the confusion of these various products might exist the cause of the different formulæ, which have been assigned to solanine. Our present paper relates to the alkaloïd of the dulcamara. The following is the result of several analyses of this substance:—

Carbon . .	60·73	60·73	60·91	
Hydrogen .	8·43	8·39	8·69	
Nitrogen .	"	"	"	3·61

These numbers enable us to establish the following formula:—

$$C^{42}\,H^{35}\,NO^{14},$$

which agrees very well with calculation:—

Calculation.		Experiment.
$C^{42}=252$	61.0	60·91
$H^{35}=35$	8.5	8·69
$N=14$	3.4	3·61
$O^{14}=112$	27.1	26·79
	100.0	100·00

M. Blanchet has arrived at a very different formula:—

$$C^{84}\,H^{68}\,NO^{28}.$$

According to him, this alkaloïd would contain per cent.—

Carbon	62·0
Hydrogen	8·9
Nitrogen	1·6
Oxygen	27·5
	100·0

M. O. Henry has arrived at the following composition:—

$$C=75{\cdot}00;\ H=9{\cdot}14;\ N=3{\cdot}08;\ O=12{\cdot}78.$$

It therefore became interesting to determine the equivalent of solanine, in order to establish its formula. Not having been able to arrive at this result by the analysis of the salts, which are all amorphous and gummy, we deduced it from that of its derivatives.

Ethylsolanine is obtained by heating to 120° C. (248° F.) in a sealed tube, an alcoholic solution of solanine and iodide of ethyle, and precipitating by the product of the reaction with ammonia. Representing the formula of solanine by—

$$C^{42}\ H^{35}\ NO^{14};$$

that of ethylsolanine would be—

$$C^{42}\ H^{34}\ (C^{4}\ H^{5})\ NO^{14}=C^{46}\ H^{39}\ NO^{14}.$$

Adopting the formula proposed by M. Blanchet, that of ethylsolanine would be—

$$C^{88}\ H^{72}\ NO^{28}.$$

The following are the results of the analyses of ethylsolanine, with regard to the theoretical data furnished by our formula, and by that of M. Blanchet:—

	Experiment.	Calculation. ($C^{46}\ H^{39}\ NO^{14}$)	Calculation. ($C^{88}\ H^{72}\ NO^{28}$)
Carbon . .	62·26	62·58	63·12
Hydrogen . .	8·85	8·8	8·59
Nitrogen . .	"	3·17	1·67
Oxygen . .	"	25·39	26·62

According to these numbers, which agree much better with our formula, we think that—

$$C^{42}\ H^{35}\ NO^{14},$$

should be adopted as the formula of the alkaloïd of dulcamara.

Ethylsolanine is a white substance, amorphous in appearance, but observed with the microscope, it appears to be composed of a mass of tangled crystals. It is without odor, has a bitter taste, is insoluble in water, and soluble in alcohol. All the salts are very soluble and gummy; they are very poisonous, and give rise to the same symptoms as solanine.

Amylsolanine is obtained like the foregoing body, substituting iodide of amyle for iodide of ethyle. Its formula is—

$$C^{42}\ H^{34}\ (C^{10}\ H^{11})\ NO^{14}=O^{52}\ H^{45}\ NO^{14}.$$

Amylsolanine and its salts greatly resemble ethylsolanine in their physical and chemical properties.

Ethylamylsolanine is obtained by the reaction of iodide of amyle on ethylsolanine, or iodide of ethyle on amylsolanine. Its formula is—

$$C^{42} H^{32} (C^4 H^5) (C^{10} H^{11}) NO^{14} = C^{56} H^{49} NO^{14}.$$

This body greatly resembles the two former in its properties.

It would be interesting to push these substitutions further, and to see whether a third equivalent of hydrogen may be replaced by a radical; but the want of materials compelled us to suspend this work, which we intend to resume, in order to arrive at the constitution of this alkaloïd.—*London Chemist*, 1857, *from Comptes Rendus, Nov.* 17*th*, 1856.

ON THE MEDICINAL USE OF COCONUT OIL.

By Mich. Pettenkofer.

It is known that vegetable fats are much less apt to become rancid than animal fats, and in consequence of that fact the oleum cocos, cocoanut oil, was several years ago in Munich proposed as a substitute for lard. Since that time it has been used in many preparations and was found to answer for various purposes.

By the animal heat of the skin it easily and perfectly liquefies, and is then most readily absorbed by the human skin. Lard, on the contrary, disappears more slowly, and is therefore to a large extent taken up by the bedclothes and garments to which even with the most scrupulous cleanliness it soon imparts a rancid smell.

Ointments prepared of hog's lard and iodide of potassium, even if the lard was quite fresh, turns yellow after a few days, owing to the elimination of free iodine, and the color becomes deeper every day. But if coconut oil be used in place of lard, the appearance of such ointments does not change at all for the space of two months or even a longer time. So might butter which is still used for eye and other salves, properly be substituted by coconut oil. Ointments like Unguentum Althææ, Linariæ, Sabinæ, Digitalis, &c., keep unaltered for a considerable time when prepared with oleum cocos, but they very soon acquire a rancid

smell when made with lard. By agitation coconut oil is able to take up one third part of water or other liquids more than lard, a property which may become valuable for the admixture of solutions of extracts and salts.

At an ordinary temperature, coconut oil has the consistency of lard, between 5 and 10°C. (40 to 50°F.) it is hard like suet; but at 25 or 30°C. (77 or 86°F.) it is semifluid, while lard does not show so much difference between these temperature. Dr. Buchner proposes the addition of wax in suitable proportions during the hot season and in warmer climates.

The peculiar smell of cocoanut oil, according to Dr. H. v. Fehling, (Annalen d. Chem. u. Pharm. 1855, liii. 399,) is due to caprylic and capronic acid, both which volatile acids accompany it in very small quantity. The amount of the first is much greater than that of the latter ; caprylic acid, however, has but a faint smell, while that of the capronic acid is much stronger, and to it really the cocoanut oil owes its peculiar perfume.

The white cocoanut oil of commerce usually requires no other treatment to adapt it for medicinal purposes, except to remelt it by a moderate heat and strain it through linen. That which has not the desired whiteness and purity may be melted, digested with coarsely powered charcoal, and afterwards filtered through paper, which may be easily accomplished as it remains liquid for some time even far below its melting point, and therefore in a moderately warm place does not present any difficulty for the filtering process. The digestion with charcoal for several hours also reduces considerably its peculiar smell.—*Buchner's N. Repertorium*, 1856, 485–488. J. M. M.

ON THE BYTTERIA FEBRIFUGA, AND ITS ACTIVE PRINCIPLE.

By M. Gerardias.

For a long time the inhabitants of the Antilles have used, to cure the intermittent fevers to which they are subject, a bitter wood, furnished by a tree which grows in Saint Martin, and which is known in that island by the common name of *bitter ash.*

M. Amic, physician in chief in the island of Martinique, wishing to ascertain the origin of this wood and the proximate principle to which it owes its properties, directed M. Gerardias,

Pharmacien to the Fleet, to isolate this proximate principle. M. Gerardias has obtained the bitter principle of the *bitter ash*, by exhausting the wood by decoction in water, treating the concentrated decoction with sub-acetate of lead, and evaporating the filtered liquid after having separated the excess of lead with sulphuric acid.

The substance which separated towards the close of the evaporation, under the form of crystalline pellicles, was dissolved in alcohol, decolored by animal charcoal, and obtained perfectly white and crystallised.

The average yield was three grammes per kilogramme of wood.

Thus obtained in a state of purity, this substance presents the following characters; it is white, crystalline, inodorous, and excessively bitter.

When slightly heated it melts into a colorless liquid, and on cooling becomes a transparent non-crystalline mass. If the heat is continued, the liquid at last disappears, after diffusing white vapors. When the heat is greater and suddenly applied it gives a brown liquid, diffusing yellow vapors which are not ammoniacal, which condense in small empyreumatic and slightly acid drops, and it leaves a very abundant carbonaceous residue.

It is nearly insoluble in cold water; nevertheless, this liquid retains sufficient to become extremely bitter; it dissolves much better with the aid of heat.

Concentrated sulphuric, nitric and hydrochloric acids dissolve it cold and without coloration; but the addition of water precipitates it immediately.

It dissolves readily without heat in alcohol, and this solution, which is neutral to litmus, is not precipitated by water. This alcoholic solution, diluted with water, is not precipitated with sub-acetate of lead, but is precipitated white by tannin and brown by ioduretted iodide of potassium.

As until then no one knew to what family the *bitter ash* belonged. MM. Chapuis, surgeon of the first class to the fleet, and Belanger, director of the *Jardin des Plantes* of Saint Pierre, were, at the desire of M. Amic, sent to Saint Martin by the Government of Martinique, to study this plant. These gentlemen determined that the *bitter ash* was a plant not hitherto de-

scribed, and should be placed among amyridæ, of the family of terebinthaceæ. M. Belanger gave it the name of *bytteria febrifuga*. M. Gerardias consequently considers that the bitter principle which he has isolated is a new one, and has given it the name of *bytterine*.

M. Belanger has since found the bytteria in Martinique, where it is known by the name of male *simaruba*, whereas the officinal simaruba is known there as the female simaruba. When M. Gerardias, wished to avail himself of this resource to prepare the bitter principle on a large scale, so as to try its power as a febrifuge, he found that this wood was of three qualities, whose differences he attributes to the conditions of vegetation, and especially to the time of the crop; the first quality, treated by the process indicated, readily yields its bitter principle; the second contains a larger proportion of mucous matters, which the subacetate of lead does not separate entirely, but which may be entirely precipitated by adding ammonia to the liquid, which is no longer rendered turbid by the subsalt of lead; the traces of metal which remain in the liquor, after the treatment by ammonia, are precipitated by carbonate of soda; then the bitter principle is separated perfectly by evaporation.

Finally, in the third quality of wood, the author has found very considerable quantities of fecula which, not being precipitated by the reagents already quoted, form a paste with the bitter principle and prevent it from being separated. The best process for the treatment of this quality of wood, appears to be the following.

The concentrated decoction is precipitated by an excess of milk of lime, a little sub-acetate of lead is added before filtering, so as to cause further precipitation, and to facilitate the deposition of that formed by the lime. The decanted liquid is then neutralised with nitric acid, then treated with sub-acetate of lead and ammonia. When all the mucous and extractive matters are eliminated, we have only to separate the last traces of lead by carbonate of soda, which precipitates the lime at the same time, and then to evaporate.

The discovery of a considerable quantity of starch in the wood of the bytteria is worthy of observation; it may become the object of study, and of important practical applications.

M. Gerardias gives the following description of the bytteria, from the samples which he procured in the neighborhood of Fort de France.

The *bytteria febrifuga* is a tree from 15 to 20 metres in height, whose diameter is about 60 centimetres; the bark is a brownish grey, slightly furrowed; the wood is light, white with yellow veins; the leaves are alternate, they are formed of from four to eight pairs of large leaflets, rather unequilateral, almost sessile, lanceolated, and of one terminal petiolated leaflet.

The flowers form a compound corymb, they are of a greenish white, hermaphrodite and complete, the calix has usually four free sepals, the corolla has four open, free petals, four stamens are inserted in a hypogenous disc. In a very few flowers we find five sepals, petals and stamens. The carpels are always two in those flowers having four petals, and in most of them with five, but in some few of the latter we find three. In all cases the carpels are attached to a very developed disc, the ovaries are perfectly free, the styles only are united from their origin, and are only divided towards their extremities, to form as many stigmas as there are ovaries. One carpel in general arrives at maturity, sometimes two may be found, but never three. The fruits are globular and dry. The seeds have no endosperm.

According to these characters, M. Gerardias thinks the bytteria should be reckoned as approaching the tribe of simarubas of the family of rutaceæ; that if, notwithstanding the characters which distinguish it from them, we do not form a new group for this plant, and still unite it to the simarubas, it should at least form a distinct genus.

M. Gerardias says, that the bytteria cannot be the same tree as the quassia of Jamaica; this latter indeed (the *simaruba excelsa* of Candolle, *picrasma* of Lindley, and Endlicher, *Jamaica quassia* of M. Guibourt,) is always described as a plant with polygamous flowers and bivalve fruits, whereas in the bytteria the fruits are always hermaphrodite and the fruit indehiscent. The fruits show no trace of separation, and if we press them hard when ripe, they break irregularly, which never occurs with other simarubas.

Finding that the bytteria so nearly approached the simarubas, M. Gerardias wished to ascertain whether bytterine were not

identical with the quassit removed from the *quassia amara* by Wiggers, and which appears to belong to all this tribe. He has found many points of resemblance between the characters given for quassit, and those which he found in bytterine.

To ascertain the identity of these two substances, he tried to obtain quassit by operating on the *quassia amara*. Having at first tried the same processes as with the bytteria, he obtained nothing, and he was obliged to use the process mentioned by Wiggers, and which requires large quantities of pure spirit and ether. With this process he obtained a small quantity of quassit, and he found that the yield of quassia was much less than that of the bytteria. The result of the comparative examination of these two bitter principles of the quassia and bytteria is that they are identical.

M. Gerardias thinks, that the bytteria being richer in quassit than the quassia amara, and moreover being commoner and growing larger, it would be the best source from which to obtain this bitter principle, and according to the nature of the wood on which we have to operate, and using the processes which he has described, that we might obtain very large quantities of quassit or of bytterine, at such low prices that the kilogramme would not exceed 250 to 300 francs. Quassit, which has hitherto been but little known and unused, because of its small quantity and high price, might take its place in therapeutics, especially if it realises the hopes raised by M. Amic's very interesting results, as a means of cure for intermittent fevers. This would be a great acquisition.

Even supposing that these hopes are not all realised, we cannot imagine that a principle with such powerful properties should not be capable of practical usefulness.—*London Chemist, April* 1857, *from Journal de Pharmacie et de Chimie, February,* 1857.

ON THE PREPARATION OF GALLIC ACID.

By F. Steer.

The author's process is essentially a combination of the modes of preparation long since described by Scheele and Braconnot. 100 pounds of the best black Turkey galls are pounded as fine

as possible, stirred up with water into a thin paste, and left standing for ten days, during which it is frequently stirred, and mixed with fresh water to replace that which is absorbed. Towards the end so much water is added that after it has quietly settled there may be three inches of it at the top; the supernatant fluid is decanted and preserved.

The paste which remains is put into a wooden vessel, adapted for extraction by displacement by water; everything soluble is then extracted.

The whole of the extracts are poured together, allowed to settle completely, decanted and strained into large stone-ware dishes, which are placed in winter in the neighborhood of a warm chamber stove, but in summer in the open air, lightly covered. They are left standing until all the gallic acid has separated, for which purpose from three to four months are required. The mother-liquors are poured off, and the yellowish-red gallic acid, which crystallizes in transparent cubes, is washed several times with distilled water and dried. From the above quantity 24 pounds of gallic acid are usually obtained.

Before this acid is bleached, it must first of all be freed from the flocculent resinous matters, which would otherwise stop up the filter. The acid is dissolved in boiling distilled water, allowed to settle whilst warm, and decanted into another glask flask; pure animal charcoal is then added to it, it is again heated and filtered whilst hot through white filtering paper. The filtrate is heated afresh, poured into the crystallizing dish, which must previously be warmed, and left to stand quietly and well covered for twenty-four hours.

The crystalline cake when taken out must be immediately wrapped up in white filtering paper, as otherwise the moist apices of the crystals are rendered black by ferruginous dust-particles floating in the air; subsequently the black color diffuses itself to the bases of the crystals, which, however, produces a remarkably beautiful appearance.

Although gallic acid is but little employed at present, except in the preparation of pyrogallic acid for photography, it is nevertheless to be expected that it will one day find frequent employment in dyeing.—*Chem. Gaz., April* 1, 1857, *from Sitzungsber. der Akad. der Wiss. zu Wien.*

ON THE PREPARATION OF PYROGALLIC ACID.

By Prof. Liebig.

The author has already called attention to the advantages of the employment of pyrogallic acid in photography; it has since almost entirely taken the place of gallic acid. He now gives a process for its preparation, which he regards as the most advantageous, and which he has employed for the last three years.

The material required is crystallized gallic acid; when decomposed by heat, it furnishes the most beautiful pyrogallic acid in very large quantity. There is no saving in the employment of dried gall-nuts or their dry extract.

For this purpose the gallic acid is strongly dried, mixed with twice its weight of coarsely powdered pumice-stone, and exposed to its temperature of decomposition in a current of carbonic acid. The mixture of gallic acid and pumice-stone is put into a tubulated retort, of which it does not fill more than one-fourth; the retort is placed in a sand-bath, and surrounded with sand nearly up to its tubulure. A glass tube is inserted into the tubulure, through an india-rubber tube, and connected with an apparatus for the evolution of carbonic acid; the tube reaches deeply into the belly of the retort, so that its opening is about $\frac{1}{2}$ inch from the mixture.

The neck of the retort, which must be tolerably wide, reaches about 8 inches beyond the margin of the sand-bath, and is loosely inserted into a corresponding receiver, so that the latter may be easily removed. The object of this arrangement is easily understood. Dry gallic acid is decomposed at a high temperature into pyrogallic acid, metagallic or melanogallic acid, carbonic acid and water; the author has supposed that from 2 atoms of gallic acid, $C^{28} H^{12} O^{20}$, there are formed 2 atoms of pyrogallic acid and 1 atom of metagallic acid, $C^{12} H^4 O^4$, with elimination of 4 atoms of carbonic acid and 2 atoms of water, so that 100 parts of dry gallic acid should furnish 39 parts of pyrogallic acid. But as pyrogallic acid is decomposed into water and metagallic acid nearly at the same temperature at which gallic acid is decomposed, the procuring of 39 per cent. of pyrogallic acid depends essentially on the rapidity with which the acid is removed

from the retort during its formation, and on the vapors being prevented from condensing in the upper part of the retort; for in this case it is impossible to avoid the fusion of the crystals and the flowing down of the fused pyrogallic acid into the belly of the retort in which it is decomposed. The current of carbonic acid serves to avoid this source of loss, but it also effects another object. In the current of gas the water formed retains its vaporous form at those places in the neck of the retort on which crystals of pyrogallic acid are deposited; in the receiver, where vapors of pyrogallic acid and water condense simultaneously, a syrupous aqueous solution is obtained instead of the crystals; from this, pyrogallic acid may be produced by evaporation, although never colorless.

It would be most advantageous to heat the gallic acid in a bath of *constant* temperature; this can never be attained by a sand-bath placed over a furnace, and the current of gas must therefore be regulated according to the temperature. Thus if drops of fused pyrogallic acid are deposited in the upper part of the retort, the heat must be increased and the current of gas slackened.

When the decomposition is going on, the wide neck of the retort becomes filled very rapidly with long, broad, flat, shining, white needles, which are removed with a feather. If the neck of the retort reaches the temperature of fusion of pyrogallic acid, it runs together, and solidifies lower down into a solid crust, which is removed with a silver spatula; during fusion the acid acquires a reddish color, which persists after solidification and cannot be got rid of by charcoal. By this method, 31–32 per cent. of solid crystallized pyrogallic acid are obtained; the 8–9 per cent. which are lost according to the above calculation, give the carbonic acid evolved the appearance of a white smoke, and probably by a judicious arrangement of the apparatus some portion of it might be recovered.—*Chem. Gaz., April* 1, 1857, *from Liebig's Annalen, January* 1857.

ON BORON.

By MM. Wöhler and Sainte-Claire Deville.

Most of the simple bodies, at least those which have been more completely examined, present themselves under interesting

forms. Boron alone, placed between carbon and silicium, both of which crystallize most perfectly, formed an exception to this rule. Investigations upon this substance, commenced by the authors separately but completed in common, have put an end to this exception, by showing that boron exists in three distinct states, thus presenting the same analogies as silicium to carbon, but in a still more marked degree.*

1. *Crystallized Boron, or Diamond of Boron.*—This substance was obtained in the form of transparent crystals, sometimes of a garnet-red and sometimes of a honey-yellow color, although the color could not be regarded as specific, for, like that of precious stones, it might be due to exceedingly small and variable quantities of foreign matters, especially silicium, carbon, or even amorphous boron. It is therefore to be hoped that crystallized boron may be obtained colorless.

The crystals possess such brilliancy and refractive power as to be only comparable to the diamond. This extreme refractive power is the cause of the metallic aspect of crystals of too large a size to be traversed by light. Probably, if boron should be obtained in large colorless crystals, it would present exactly the aspect of the diamond.

Another very important analogy is its hardness. Boron scratches corundum with the greatest ease, so that a cut sapphire, submitted to the action of the powder of boron, very rapidly lost its angles. A cut diamond, with which the crystals of boron were crushed upon a surface of polished quartz, was slightly attacked at all the points of contact. Boron must therefore be regarded as the hardest of all known bodies, or at all events next to the diamond.

The crystalline form of boron has still to be ascertained. The authors have frequently obtained pretty large crystals of boron; but on closely examining these, they proved to be very complicated macles, produced by the regular aggregation of a great number of very small elementary crystals. From their behaviour towards polarized light, the crystals do not appear to belong to the regular system.

* The boron analogous to ordinary carbon was discovered by Gay-Lussac and Thenard, by the reaction of potassium upon boracic acid.

Pulverulent boron, which it is almost impossible to obtain pure by the process of Berzelius, was fused by M. Despretz with the pile. With the heat of the oxhydrogen flame, no perceptible fusion took place with crystallized boron. Crystallized boron, when strongly heated, resists the action of oxygen; it becomes oxidized at the temperature at which the diamond burns, but a little stratum of boracic acid, which forms upon its surface and is easily seen, prevents the extension of the action.

Chlorine, on the contrary, acts with remarkable energy upon boron, which becomes red-hot in an atmosphere of this gas, and is converted into gaseous chloride of boron; it is difficult to get chlorine sufficiently dry to avoid the production of a little vapor in this experiment, and a little boracic acid is deposited, arising from the water and air contained in the chlorine. Crystallized boron burns without residue; the apparent inflation of the crystals, characteristic of the combustion of the diamond in oxygen, is also manifested.

When heated with the blowpipe between two plates of platinum, it immediately causes the fusion of the metal in consequence of the formation of a boride.* No acids, whether pure or mixed, have any action upon boron, either cold or hot; at a red heat bisulphate of potash converts it into boracic acid, with evolution of sulphurous acid.

Boiling concentrated caustic soda does not change it; but monohydrated soda and carbonate of soda dissolves it slowly at a red heat. Nitrate of potash does not appear to act upon crystallized boron at this temperature; it is therefore the most unalterable of all simple bodies.

It is prepared by fusing together in a charcoal crucible 80 grms. of aluminium in large fragments, and 100 grms. of fragments of fused boracic acid. The charcoal crucible is luted into a good black-lead crucible, and the whole put into a blast-furnace capable of easily fusing pure nickel. The temperature is kept at its maximum for about five hours, care being taken to clear the bars of all ashes. When cold, the crucible is broken, and two distinct strata are found in it,—one vitreous, composed of

* Very curious alloys of boron with platinum and palladium have been obtained.

boracic acid and alumina, and the other metallic and cavernous, of an iron-gray color, beset with little crystals of boron; it is aluminium, impregnated throughout with crystallized boron. All the metallic portion is treated with a moderately concentrated boiling solution of soda, which dissolves the aluminium; then with boiling muriatic acid, which removes the iron; and lastly, with a mixture of hydrofluoric and nitric acids, to extract the traces of silicium, which the soda may have left mixed with the boron. The boron is not pure, however; it contains laminæ of aluminium, which may be extracted mechanically, but cannot be separated from the boron by any chemical process.

The vitreous matter, when boiled with water, gives a large quantity of boracic acid and a gelatinous matter, which, is nearly pure alumina. The spontaneous separation of alumina from boracic acid is in accordance with Rose's observations on the action of water upon the borates with insoluble bases.

2. *Graphitoid Boron.*—Aluminium dissolves but little boron. Thus it is usually obtained only in small quantity in this new form, when an alloy of boron and aluminium is dissolved in the way already described for the preparation of graphitoid silicium. A little is obtained in the preceding experiment, and it is easily separated from the crystallized boron from the facility with which it may be suspended in water. Graphitoid boron may also be easily produced by treating fluoborate of potash with aluminium, and adding as a flux a mixture of equal equivalents of the chlorides of potassium and sodium. Small ingots of boride of aluminium are obtained, and these, when dissolved in muriatic acid, deposit the boron in its second modification. This consists of spangles, which are often hexagonal; they are slightly reddish, and have exactly the form and brilliancy of natural graphite and graphitoid silicium. It is completely opake.

3. *Amorphous Boron, or Boron* of Gay-Lussac and Thenard.—This is also produced in the experiment which yields crystallized boron; it is sufficient for this purpose that a small globule of aluminium should be in contact with a great mass of boracic acid. The reaction then takes place rapidly; the aluminium cannot dissolve the boron as fast as it is separated, and after the action of soda and acids a bright chocolate-brown substance is obtained, having all the properties assigned by Gay-Lussac,

Thenard, and Berzelius to the amorphous boron with which they were acquainted.

When amorphous boron is collected on a filter, all that remains adhering to the latter when well dried, burns with remarkable facility and brilliancy when the paper is set on fire. Graphitoid boron, on the contrary, resists the heat produced by the combustion of paper.

From these facts it appears that boron should be placed still nearer than silicium to carbon.—*Chem. Gaz., May*, 1857, *from Comptes Rendus, Dec.* 8, 1856.

NOTE ON THE ANOMALIES PRESENTED BY ALUMINIUM.

By C. Tissier.

Relation between the Density and Alterability.—Hitherto the least oxidizable metals have been amongst the heaviest, such as mercury, silver, gold, and platinum; nevertheless, aluminium, the density of which is only 2.56, is the least alterable of all the ordinary metals, after silver, gold, and platinum.

Relation between the Atomic Weight and the Alterability.—In general the metals are more alterable the lower their atomic weight; nevertheless, the atom of aluminium, the alterability of which is so small, only weighs 14; that is to say, it has the lowest atomic weight of all the ordinary metals. It is the half of that of iron, which is 28.

Relation between the Density and the Physical Properties of Metals.—We do not know of any other body of so little density, which possesses like aluminium, the hardness, malleability, tenacity, conductibility, and sonorousness charcteristic of what is called a metal.

Aluminium and Thenard's Classification.—According to Sainte-Claire Deville, aluminium does not decompose water;* it should therefore be ranged at least in the fourth section, according to Thenard's classification, and yet its oxide (alumina) is not reducible by hydrogen and carbon, or even by sodium or potassium.

* We admit that it absorbs oxygen from the air at a very high temperature.

Aluminium does not decompose water, and it decomposes carbonic acid and silicic acid exactly in the same way as potassium or sodium.

What rank must be assigned to Aluminium?—This metal ranks not far from silver in its action upon water and oxygen; near the alkaline metals in its action upon silicic, boracic and carbonic acids, and near iron in its action upon the metallic oxides; in fact, it decomposes all the oxides which are decomposed by iron, except the oxide of zinc. According to this last peculiarity, aluminium would have less affinity for oxygen than iron, and would range beside iron, but below it.

In considering what place aluminium should occupy in the electro-chemical series, we find that it precipitates all the metals from their chlorides up to lead and cadmium inclusive,* so that it comes between cadmium and iron.

To sum up, until chemistry has made further progress, we must not hope to assign aluminium an *exact* place in the classifications. However, as M. Sainte-Claire Deville has said, it will certainly be least out of place by the side of iron. We know, in fact, that at a high temperature iron also decomposes silicic, boracic and carbonic acids; and if aluminium has not the same action upon oxygen and water as iron, it is, as M. Deville has also observed, because we do not know an oxide of aluminium of the formula $R^3 O^4$, an oxide which iron always tends to produce at a high temperature.

Lastly, taking into consideration the electro-chemical properties, it is still in the neighborhood of iron that aluminium would be placed.

The remarkable properties which distinguish this metal from all others are therefore—

1. Its slight density.
2. Its resistance to the action of the oxyacids and sulphuretted compounds, which approximates it to gold and platinum.
3. The difficulty with which it enters into alloys, a property which is not shared by the other malleable metals; for iron, zinc, lead, tin, copper, silver, gold, and platinum are capable of form-

* This observation is the result of personal experiments. Aluminium has no action upon the chlorides of iron, zinc, and manganese.

ing more or less malleable alloys, whilst aluminium cannot bear more than 10 per cent. of foreign metal, or enter into combination itself in greater proportion, without greatly modifying the durability of the metal with which it is alloyed.—*Chem. Gaz., March*, 1857, *from Comptes Rendus, Feb.* 16, 1857.

THE PREPARATIONS OF ARSENIC EMPLOYED IN MEDICINE.

By A. F. Haselden.

In introducing this subject, he said he had nothing new to offer with reference to the medicines he was about to notice, but he thought some benefit might result from a discussion of the relative merits of the different compounds of preparations of arsenic used in medicine, with the view of eliciting the opinions of those present as to which of them ought to be ordered in our Pharmacopœia. At present there were only two preparations of arsenic in the London Pharmacopœia, while there were several others frequently used in medicine, and ordered in other Pharmacopœias. He proposed briefly to describe or refer to the principal arsenical compounds in use, so as to bring the subject fairly before the meeting, and present the points upon which the expression of opinion was desired.

Liquor Potassæ Arsenitis, of the London Pharmacopœia, claimed the first notice, from the fact of its having maintained its position through several generations of Pharmacopœias, and of its being more generally used by English medical practitioners than any other arsenical preparation. By many medical men this was the only preparation of arsenic ever prescribed, but whether this circumstance arose from their considering it superior to all the others, or from their being unwilling to try the effects of any new preparations of so powerful an agent as arsenic, he was unable to say. There appeared to be a difference of opinion as to whether this preparation was rightly called an arsenite of potash or not, some persons contending that the old name of *Liquor Arsenicalis* was a more correct one.

Liquor Arsenici Chloridi had been introduced into the London Pharmacopœia of 1851 for the first time. It was understood to be intended to represent an old preparation, known as De Val-

lenger's mineral solution. It was a solution of 1¼ grain of arsenious acid with a little hydrochloric acid in one ounce of water. This and the preceding preparation constituted the only compounds of arsenic ordered in the London Pharmacopœia. Being both in the liquid form, it was to be regretted that they were not of the same strength.

Among the preparations not contained in the Pharmacopœia, there were—

Liquor Sodæ Arseniatis (Pearson's Solution,) and *Liquor Ammoniæ Arseniatis.* These were solutions of either salt, in the proportion of four grains to the ounce; being the same relative strength as the Liquor Potassæ Arsenitis, over which it was questionable whether they possessed any advantage.

Arsenici Iodidum, or, as it was sometimes called, *Arsenici Teriodidum*, was ordered in foreign Pharmacopœias, where instructions, not all alike, were given for its preparation. This compound was sometimes used in this country, although not recognized in our Pharmacopœias. A solution of two grains to an ounce of water was found to keep without change, but in a stronger solution a precipitate formed. The author stated that he had tried both glycerine and sugar for preventing the decomposition and precipitation which occurs in the stronger solution, and found sugar to succeed better than glycerine. He had also obtained a similar result with iodide of iron.

Liquor Arsenici et Hydrargyri Hydriodatis, or, as it was sometimes called, *Donovan's Solution*, had been used to some extent, and a formula for it was now given in the Dublin Pharmacopœia. Several modifications in the process for its preparation had been suggested since it was first introduced by Mr. Donovan. The most simple process was that of the United States Pharmamacopœia, where iodide of arsenic and red iodide of mercury were directed to be rubbed together with water, and the solution completed by the application of heat.

Quinæ Arsenias, and other compounds of quinine and arsenic, were sometimes ordered in medicine, but there were no formulæ for their preparation in any of the Pharmacopœias.

Ferri Arsenias, obtained in the form of a dirty green precipitate, on adding arseniate of soda to sulphate of iron, was the last of these preparations to which he would refer.

Having thus brought the different medical preparations of arsenic under notice, he thought it worthy of consideration whether any of them, not at present contained in our Pharmacopœia, ought to be introduced there. Arsenic was described by medical writers as a valuable remedial agent, especially for skin diseases and for ague. In the Pharmacopœia of the Hospital for Diseases of the Skin, there were no less than seven different preparations containing arsenic, ordered for internal administration. He might also refer to the popular use said to be made of arsenic in some parts of Lower Austria, where, according to the late Professor Johnstone, it was extensively used by the common people, with the view of improving their personal appearance.

The author concluded with the following remarks: "To return to our subject, would it be advisable to add any of the preparations I have noticed to the future Pharmacopœia? Differences of opinion no doubt exist with reference to this question, and on this account I have introduced the subject for discussion here. It may be urged that the profession have the simple substances and can unite them as they please, but, on the other hand, it is well known that few remedies are much employed until introduced in some well-defined and manageable form. Again, it may be said, that if every preparation used in medicine were introduced into the Pharmacopœia, this work would be rendered too voluminous; but I think that a work for the guidance of every branch of the profession, from the Physician to the Pharmaceutist, cannot contain too large an amount of instruction and information up to the latest date, for it would be far more convenient to refer to one volume for the information required, than to have to search through many works, including journals and pamphlets." —*Pharm. Jour. and Trans., May* 1, 1857.

DESCRIPTIVE NOTICE OF SOME FRENCH PHARMACEUTICAL SPECIALITIES,

With specimens presented to the Society by D. S. KEMP, Associate and Resident in Paris.

Communicated by Mr. H. C. Baildon.

[The remarks by Mr. Kemp, and those of Mr. Baildon, which follow, are extracted from the proceedings of the Scottish branch of the Pharmaceutical Society, published in the Pharmaceutical Journal for May, 1857.—EDITOR.]

Thinking it probable that Mr. Kemp, from the favorable position occupied by him in Paris, might be able to contribute some interesting information connected with French pharmacy, I some time since wrote to him on the subject. In reply, he promised to do so; and, in February, I had a letter from him, in which he says: "The usual pressure of business at this season has prevented me fulfilling my promise until now of sending you some matter or other for communication to the Pharmaceutical Society; I hope, however, it is not yet too late for the season. Finding it quite out of my power at this time to get up anything like a scientific article, I have sent one or two specimens of French Specialities, with a written notice of each, which may possibly interest some of the members of the Society." He continues: "I am really sorry that I have not been able to send you something more deserving of your attention; but I think I may promise you some matter possessing the merit of originality, if I am spared till next season." In continuation, he writes:

"This communication is not intended as more than a descriptive notice of the few specimens of French Pharmaceutical Specialities which it accompanies. These are only a selection of the most elegant, from a vast number of others well known in France, and many of which are a source of no little pecuniary gain to their proprietors.

"Those of the selection in the form of pills are three in number; two of them preparations of iron, and the third of digitaline.

"The 'Pilules de Vallet,' or Vallet's Pills, contain the protocarbonate of iron in a perfect state of preservation. This is effected by the following process:—The sulphate of iron and carbonate of soda are dissolved in water containing a sixteenth of its weight of simple syrup; the precipitate, washed with water and syrup in the same proportions, and expressed in a cloth saturated with syrup, is well mixed with honey, and evaporated to a proper consistence for pills; the pills are afterwards silvered and kept in bottles, and contain each about a quarter of a grain of proto-carbonate of iron along with a little inert powder. They are beautifully finished, and preserve their shape for any time.

"The 'Pilules de Blanchard' contain the protoiodide of iron.

They are prepared by evaporating a solution of iodide of iron (prepared in the usual way with iodine and iron filings) along with honey to a thick consistence, and forming a mass by the addition of a little marsh mallow and liquorice powder. In the process, the greatest care is taken to prevent the decomposition of the iodide ; the pills are rolled in powder of iron and on an iron-pill machine, and are finally varnished with a solution of balsam of tolu in ether. Each pill contains one grain of proto-iodide of iron and a sixth of a grain of metallic iron.

"The granules of digitaline form a convenient method of administering that powerful medicine, each containing one milligramme ($\frac{1}{60}$th of a grain) of digitaline, mixed with powdered sugar.

"The 'Dragées (or Bonbons) de Gille' contain also the proto-iodide of iron, about one grain in each. It is contained in a pill in the centre of the dragée.

"The method of their preparation is too obvious to require explanation. It is a form of medicine more suited to the French than to the British taste.

"The next form of medicines shown in the specimens is the most elegant of all.

"The 'Perles d'Ether' and 'Perles de Terebenthine,' are small gelatine capsules, containing respectively pure ether and turpentine ; they are prepared by a process kept secret by the proprietor, and are of unequalled beauty and finish ; each contains from four to five minims of sulphuric ether or oil of turpentine.

"The capsules of Mathey-Caylus and Raquin are both very fine illustrations of the perfection to which the process of capsulation has been brought.

"Those of Raquin contain copaiva thickened with $\frac{1}{32}$ of its weight of magnesia, and those of Mathey-Caylus are prepared with pure copaiva, copaiva and citrate of iron, copaiva and cubebs, and five other combinations of the same medicine, as well as Venice turpentine.

"The specimen sent contains copaiva with citrate of iron, a very useful combination.

"The capsules of both makers are composed of gluten from oat flour, not gelatine.

"If some of these preparations were manufactured by English or Scotch Pharmaciens, they would probably obtain a reputation equal to that which they hold in France.

"*6th February*, 1857." "D. S. KEMP.

Remarks by Mr. Baildon.

I think, Sir, that you will agree with me, that these specimens are very interesting, and that they demonstrate how very far our ingenious neighbors are before us, even in the mechanical part of our profession. I have never before seen anything at all to compare with the elegance and beauty of finish manifested in the Perles d'Ether. The method of coating pills used by Mons. Blanchard might be applicable not only for all pills kept ready made for sale, but also modified in a way I shall immediately allude to, for pills made to prescriptions, not only to prevent them from hardening, but also most effectually to cover any unpleasant taste or smell. A solution of balsam, of tolu in ether (Mons. Blanchard's method) I did not find sufficiently volatile, as pills coated with it took upwards of three hours to dry, but by using chloroform as the solvent in the proportion of a dram of the balsam to three drams of chloroform, twenty minutes was quite sufficient to make the pills non-adhesive. I have brought specimens of pills varnished with the two solutions named. The chloroform and balsam solution is not only preferable from the shortness of the time required to complete the process, but the pills have a much more finished appearance. The superiority of this method of preserving pills over any kind of powder, appears to me very great, and it is also certainly preferable to the coating of pills with silver leaf. It will, I am satisfied, be found more effectual in preserving pills soft as well as in covering the taste and smell of the drugs used.

Professor Christison states in the introduction to his Dispensatory, "A few years ago it was ingeniously proposed in France to cover pills with gelatine by dipping them into a solution of bone-gelatine or isinglass. The method is troublesome, but otherwise answers well with most pills." The process just described is equally efficacious, and is attended with but little trouble.

The process was then shown. It consisted in placing a few drops of the solution in a suitable box, shaking the pills in it. and then turning them upon a slab, and so placing them that one pill did not touch another. In a few minutes they were quite dry.

OBSERVATIONS ON ROCK SALT.

By M. Marguerite.

It is well known that when salt is fused, it crystallizes on cooling in various forms, especially in cubes; these crystals are more or less confused, opake, and always colored when common salt or crude rock-salt is employed. The results are different when pure salt is calcined, kept in a state of quiet fusion, and cooled slowly; in this crystals are formed, sometimes of considerable volume, and perfectly transparent.

When protected from the air, rock-salt in its native state, that is to say, presenting various gray, red or brown tints, may be fused without decolorization; but if the calcination takes place in contact with the air, and, as in the preceding case, the fusion is tranquil and the refrigeration slow, the earthy matters are deposited at the bottom of the crucible, the chloride of magnesium is spontaneously decomposed in contact with the moist atmosphere, the coloring matters are destroyed under the oxidizing action of the air, and all the impurities are eliminated by the crystallization which takes place in the mass; in this way two very distinct strata, which are easily separated, are formed in the mass. This operation might perhaps be applied with advantage to the purification of crude rock-salt, and also to that of ordinary sea-salt.

The fusion of salt, effected with or without the contact of the air, would explain, up to a certain point, how the salt which is found in the bosom of the earth is contaminated with coloring matters, and how, on the contrary, that which has been exposed to an oxidizing atmosphere is white and transparent.

From these facts we can come to no conclusion as to the origin and formation of rock-salt; for although by fusion we can obtain salt having the aspect, the transparency, and the physical properties of the latter, it is nevertheless certain that the presence

of organic remains in the heart of the natural product excludes the probability of its igneous formation; and it would also be difficult to understand how, if a fusion of the mass really took place, the chloride of magnesium was not decomposed. As to the phenomenon of decrepitation, since it is observed to a certain extent in rock-salt as well as in that which has been crystallized in the humid way, it cannot serve as a character in support of the hypothesis of igneous formation.—*Chem. Gaz., March*, 1857, *from Comptes Rendus, Feb.* 1857.

ON THE PREPARATION OF A WRITING-INK IN CAKES.

By A. Leonhardi.

After the author had discovered the mode of preparation of the so-called alizarine-ink, which is particularly useful, he was anxious to prepare it in a form which would allow it to be sent to a great distance, and at any time of the year render its transport convenient, and diminish its cost considerably, but at the same time fulfil all the requirements of an excellent article. This is attained by the dry alizarine-ink in cakes. The "ink powders" hitherto found in commerce are not to be compared with it, for they not only possess a different composition, but never dissolve completely to form a clear solution in water, and their employment is attended with so many inconveniences and disadvantages, that they have been given up. Common black ink may indeed be evaporated to dryness, but it leaves a residue which does not again dissolve completely in water, and never furnishes a useful ink by this solution. The recipe for the preparation of this cake-ink is as follows:—

42 parts of Aleppo galls and 3 parts of Dutch madder are extracted with a sufficient quantity of hot water; the fluid is then filtered, $5\frac{1}{5}$ parts of sulphate of iron are dissolved in it, and 2 parts of a solution of iron in wood-vinegar, with $1\frac{1}{5}$ part of solution of indigo, are added to it. The mixture is evaporated to dryness at a moderate heat, and formed into cakes of a proper size (for instance 5 inches long, $3\frac{1}{2}$ inches broad, and $\frac{3}{8}$ inch thick).

1 part of this cake-ink dissolved in 6 parts of hot water, fur-

nishes an excellent writing and copying ink, whilst even with 1 part of cake-ink and 10 to 15 parts of water, beautiful writing-inks are obtained.—*Chem. Gaz., March*, 1857, *from Mittheil. des Gewerbevereins für das Könifir. Hannover.*

PREPARATION OF DYE PIGMENT FROM QUERCITRON BARK.

Quercitron bark contains a considerable amount of tannin, which in the dyeing enters into combination with the mordants, and thereby injures the brightness of the colors. When the bark is treated with sulphuric acid the tannin is separated, and the colors then obtained are much brighter and richer.

M. Rigaud's observation that quercitron is converted by the action of sulphuric acid into quercitin was first practically applied by M. Leeshing, who subjected quercitron bark to the action of sulphuric acid.

Hr. Schäffer recommends the following proportions:—

Quercitron bark	100 parts
Water	280 "
Sulphuric acid	26 "

The bark is to be boiled for two hours with the acid, then washed five or six times by decantation, and the residue pressed. This product, when dry, is equal to three times as much of the bark.

Hr. Schlumberger recommends:—

Quercitron bark	100 parts
Water	300 "
Sulphuric acid	15 "

He finds that the conversion of tannin into gallic acid requires a temperature of 212° F.; that neither lime nor potash is extracted from the bark by this treatment. When the product is mixed with cold water, and then with pernitrate of iron, the reaction of tannin is very slight, but an alcoholic decoction gives a precipitate with gelatine. He also finds that when quercitron bark, or the product obtained by the action of sulphuric acid upon the bark, is mixed with tannin, the colors obtained are somewhat darker, but more muddy; the addition of gelatine counteracts this effect completely. When gallic acid was added in the dye-

ing operation, the mordants were dissolved, as might have been expected, in accordance with the results obtained by Prof. Calvert. This fact shows further that the gallic acid produced by the action of sulphuric acid upon the tannin of the quercitron bark is removed by the washing, for otherwise the dyeing capability would be reduced instead of increased by this treatment.

By the treatment of quercitron bark with sulphuric acid the color substance must have undergone a change, because the color is fixed by mordants only at a high temperature, and is almost insoluble. An aqueous decoction deposits on cooling a copious yellow sediment, which appears to be Rigaud's quercitin.

Logwood, Lima wood, sandal wood, turmeric, Cuba wood, sumach, yellow berries, woad, galls, and pomegranate shells were subjected to the action of sulphuric acid in a similar manner, then washed, pressed, and dried. Hr. Schlumberger found that logwood, Lima wood, and sandal wood were injured by this treatment, but that the result was very advantageous with the other dye stuffs. The most striking effect was produced with sumach, when the water was mixed with 40 or 50 per cent. sulphuric acid by volume. The product, which may be called sumacin, thus obtained, gives finer yellow, grey, and black than quercitron, and the dyeing capability is increased fourfold; when mixed with garancin the color obtained has more body, and the violet is not injured so much as is the case in dyeing with an admixture of wood containing tannin. Woad likewise acquires a much greater dyeing capability by the action of sulphuric acid, and the color it gives is purer, but it requires then a temperature of 158° F. for dyeing.

Yellow berries, Cuba wood, and turmeric, treated in the same manner, give very satisfactory results in dyeing. For these substances, the liquid should contain from 15 to 20 per cent. concentrated sulphuric acid. The tannic acid of nutgalls and of pomegranate shells is not all converted into gallic acid by the action of sulphuric acid, but more color substance is set at liberty. The colors produced with aluminous mordants are more decidedly yellow, and those produced with iron mordants are clearer. A stronger acid should be used for nutgalls than for pomegranate shells.—*London Pharm. Jour., May* 1, 1857.

ON THE TOXICOLOGY OF STRYCHNIA.

By J. E. D. Rodgers, Esq.,
Lecturer on Chemistry at St. George's School of Medicine; and
G. P. Girdwood, Esq.,
Assistant-Surgeon, Grenadier Guards.

Can strychnine be detected after death, when it has been administered in a dose only sufficient to destroy life? or is it so altered in the process of destruction of life, as to cease to be strychnine? are questions that it is the object of this paper to answer.

Let us first inquire the facts upon which the opinion that strychnine *cannot* be detected in the tissues and fluids of the body is based, and it will soon be seen that they are of the most slender nature, founded on the results of experiments and analyses of a most unsatisfactory and imperfect character.

Dr. Christison many years ago, poisoned animals with doses of strychnine varying in strength, and generally failed in its discovery by subsequent analysis. Dr. Taylor, at the trial of William Palmer, gave in evidence that he had killed four rabbits by the administration of strychnine. In the first experiment he gave two grains; in the second and third, one grain; and in the fourth, half a grain; and failed to discover it by chemical means in three out of the four—the successful case being that in which he had given the large dose of two grains—a dose which every one must admit far exceeds the quantity necessary to destroy life. Drs. De Vry and Van de Burgh, from their interesting and well-devised series of experiments, the results of which were given in a paper read at the last meeting of this Society, have come to the conclusion that it can only be detected when the dose given exceeds that necessary to destroy life.

Let us next inquire what are the essentials of a process that will enable the analyst to obtain the strychnine in such a condition as to prove its presence indubitably. They are, that it should be capable of disintegrating the substances in which it is present, so completely, that it cannot escape solution; and that, finally, it should yield the strychnine in a state of perfect freedom from foreign organic matter.

Have the processes employed by Drs. Christison, Taylor, De Vry, and Van de Burgh these requisites? Decidedly not. The

process given by Dr. Taylor at the trial of Palmer—and Dr. Christison stated on that occasion that he had pursued a similar mode of analysis—consisted in digesting the matter suspected in spirit of wine acidulated with sulphuric acid, filtering, gently evaporating, and finally adding carbonate of potash to precipitate the strychnine, which was then tested. We need scarcely remark that such a process would never yield strychnine, if present in minute quantity, in that state of freedom from organic matter to admit of satisfactory testing, and would utterly fail when blood, urine, and tissues were the subjects of analysis; indeed, it is obvious that the minute quantity to be extracted in the latter analysis could never be precipitated at all, seeing that each drop of water is capable of retaining $\frac{1}{7000}$ of a grain of strychnine. The process of Staâs adopted by Dr. De Vry is immeasurably superior to the preceding, but that it is not possessed of the requisite degree of perfection is evident from his own experiment cited in proof of its perfection. This experiment, you may remember, consisted in mixing the quarter of a grain of strychnine with one egg, and then coagulating the mixture by the heat of boiling water, and subjecting it to Staâs' process, by which he recovered "*almost the whole*" of the strychnine. This word "almost" proves the imperfection of the process, for it shows that under favorable circumstances a quantity appreciable by the balance was lost, while in the analysis of urine, bones, and small quantities of the other tissues, you have to separate an amount of poison that is quite inappreciable by the balance. The loss is owing to the fact that the spirit of wine and acid employed do not disintegrate the tissues in the manner necessary for the separation of the quantity of strychnine conveyed by the blood to the various tissues and organs; indeed, the hardening effect of the spirit would rather favor the retention than the separation of the strychnine.

The process adopted by us is as follows:—The substance operated upon is digested with dilute hydrochloric acid, one to ten, until it is apparently fluid; the liquid is then filtered and evaporated to dryness over a water-bath, treated with spirit as long as anything is dissolved, and the filtered tincture evaporated as before, and the residue treated with water and filtered; this aqueous solution must now be rendered alkaline by ammonia,

and agitated in a bottle or long tube, with about half an ounce of chloroform; after subsidence, the chloroform is drawn off by means of a pipette, transferred to an evaporating basin, and the chloroform expelled over a water-bath; the residue must then be moistened with concentrated sulphuric acid, and exposed for some hours to the temperature of a water-bath, by which proceeding, all organic matter except the strychnine is destroyed. The charred mass is then treated with water, and the solution filtered to separate the carbon; excess of ammonia is now added, and the solution again agitated with about one drachm of chloroform; if on evaporating a small portion of this chloroform solution, and treating the residue with concentrated sulphuric acid, any charring takes place, the preceding process must be repeated, when the last chloroform solution will afford the strychnine sufficiently pure for conclusive testing. For this purpose a small quantity is taken up in a capillary tube, and allowed to evaporate on the smallest spot possible of a warm porcelain capsule, by adding successive drops until the whole is evaporated on the spot. If the quantity is large—say from $\frac{1}{2000}$ of a grain to a larger quantity—the method we have pursued is similar to that employed by Dr. De Vry and others, viz., moistening the spot (when the capsule is quite cold) with concentrated sulphuric acid, and then adding a minute fragment of bichromate of potash. If, however, the quantity is very small, no color will be perceived by this mode of testing, then the sulphuric acid rendered slightly yellow by chromic acid will be found successful.

We would here remark that the recommendation to stir the spot moistened with sulphuric acid with a glass rod, previous to the addition of the bichromate, is highly objectionable, and will frequently occasion failure, by removing the acid sulphate of strychnine, which would otherwise, by adhering to the porcelain, facilitate the action of the test. The superiority of our mode of operating will be seen by the following analyses, performed during the last few days. On the 26th ult., at three o'clock P.M., 1-30th of a grain of strychnine was given to a rabbit weighing nearly four pounds; at four a second 1-30th; at half-past four a third dose was administered, after which he evinced slight signs of twitching on being touched, or on a noise; at five a fourth dose was given; at half-past five a glass beaker fell

and was broken near him, which caused a sudden spasm with opisthotonos (lasting fifteen seconds); at quarter to six another 1-30th (making 5-30ths) was given; at twelve minutes past six a bunch of keys was dropped near him; the noise occasioned an immediate spasm, accompanied, as before, with opisthotonos, which lasted a few seconds; a second on touching him, followed by a remission, when, on again touching him, a third attack was produced, which ended fatally in a few seconds, relaxation of all the muscles indicating decease; rigor mortis came on in three minutes after death, and passed off in the succeeding twenty-four hours. On examination the blood was found coagulated. The contents of the stomach, analyzed by the process given, yielded strychnine in abundance.

Half pound of flesh also yielded strychnine in abundance. Two drachms of urine collected after death, also yielded strychnine by the following mode of analysis: it was diluted with an ounce of water rendered alkaline by ammonia, and filtered; the filtrate was then agitated with chloroform in a long tube, the chloroform separated as directed, was then evaporated in a porcelain dish, the residue charred with sulphuric acid, as already detailed; this operation was repeated three times, when the last chloroform solution yielded the strychnine as stated.

The bones of the extremities, the pelvis, and part of the vertebral column, containing its share of the spinal marrow, all being entirely denuded of flesh, were treated as follows: They were covered in a deep evaporating basin with dilute hydrochloric acid, and digested over a water-bath until the whole were dissolved; the solution filtered, the filterate was then treated with concentrated sulphuric acid drop by drop as long as a precipitate fell, adding water when necessary; the solution was again filtered, and about six drachms of sulphate of magnesia and ammonia in excess added; the solution was again filtered, and the clear liquid agitated with chloroform; the chloroform solution, after being treated in the way already detailed, yielded distinct evidence of strychnine.—

To these results must be added our former experiments, which we have already published, and which were briefly as follows:—

The blood and contents of stomach of a dog poisoned by two grains of strychnine were, after putrefaction, subjected to analysis, both yielding strychnine.

The muscles, viscera, and bones of a dog, poisoned with a grain of strychnine, were separately subjected to analysis, thirteen months after interment. Strychnine was discovered in every instance.

The organs and contents of stomach of a rabbit, poisoned by half a grain of strychnine, yielded that alkaloid in each analysis.

The viscera and contents of stomach of a rabbit poisoned by half a grain of strychnine and five grains of tartar emetic, yielded antimony and strychnine also in each analysis.

The body of this rabbit was allowed to decompose in contact with air for nine months. When dry, the bones separated, and all the other tissues, almost pulverulent, subjected to the mode of analysis described by us for the bones, yielded abundance of strychnine.

From the results of the foregoing experiments, we cannot avoid the following conclusions:—

(1.) That the opinion, that strychnine can only be detected when the poison is in excess, is untenable, and not supported by trustworthy analyses.

(2.) That the opinion, that strychnine is decomposed in the process of destruction of life, is founded on the results of analyses made by imperfect processes, and hence is unsound and unphilosophical.

(3.) That strychnine can always be detected, when it has occasioned death, in the blood, organs, and tissues of the body, quite independently of the contents of the stomach.

(4.) That it is found unchanged in the urine.

(5.) That the delicacy of the reactions of strychnine, and its extraordinary stable qualities, render its detection more certain than any other poison.—*London Pharm. Journ., April*, 1857.

ON MAGNESIUM, ITS PREPARATION AND VOLATILIZATION.

By MM. H. Sainte-Claire Deville and Caron.

The chemical properties of magnesium have been determined with great perfection by M. Bussy, who discovered this metal, and all the experiments since made have confirmed his results.

One of the physical properties of magnesium, however, has

not hitherto been ascertained; it is a new fact which still further approximates zinc and magnesium, and gives them an additional property in common. Magnesium is volatile, like zinc, and nearly at the same temperature. Thirty grammes of it have been distilled with ease in charcoal vessels. When the magnesium is pure it leaves no residue, and the sublimed metal is white and surrounded by a small quantity of oxide. When it is impure, it leaves in the charcoal tray a certain quantity of very light and complex black matter, and the distilled magnesium is covered with little colorless, transparent needles, which are rapidly destroyed with formation of ammonia and magnesia, indicating the probable existence of a nitruret of magnesium analogous to the remarkable bodies already discovered by Wöhler and Rose for a certain number of simple bodies.

Magnesium fuses at a temperature very near that of the fusion of zinc. At a temperature a little higher it ignites, producing a brilliant flame, in the midst of which indigo-blue tufts are seen, especially when a jet of oxygen is thrown upon the fused metal from an oxyhydrogen blowpipe. The combustion of magnesium is accompanied by all the phenomena observed with zinc, denoting a volatile metal, the oxide of which is fixed and infusible; a brilliant flame, a deposition of magnesium flakes and a rapid combustion.

The density of magnesium is 1·75. The malleability and ductility of magnesium, and the dependent physical properties, are still under investigation, as well as its electrical conductibility, which is interesting on account of its extreme lightness. It files very easily and burnishes wonderfully. It resists the air very well, especially when it is pure and its surface is polished; it is therefore comparable in this respect with zinc, which perhaps is a little more resistant.

Magnesium may be prepared by the process employed for aluminium, which, however, must be slightly modified, as magnesium is lighter than the scoria from which it is produced. 600 grms. of carefully prepared chloride of magnesium are mixed with 100 grms. of fused sea-salt (or better, of a mixture of chloride of sodium and potassium) and 100 grms. of pure fluoride of calcium, the whole previously powdered. 100 grms. of sodium in fragments are added and mixed intimately with the powdered

chloride, and the whole is thrown, by means of a little iron spatula, into a red-hot earthen crucible, which is closed with its cover. In a short time the reaction takes place. When all noise has ceased, the crucible is uncovered, and the mixture is stirred with an iron rod until all the fused parts are homogeneous and the upper part of the bath is well exposed, when the globules of magnesium are distinctly seen. The crucible is allowed to cool away from the fire, and when the saline mass is ready to solidify, it is again stirred with the iron rod, and all the little metallic masses are collected so that they may form a single one; the whole is then poured upon a plate of iron. By breaking up the scoria the globules of magnesium may be removed, and the scoria may be fused once or even twice, affording a little more magnesium each time; 600 grms. of chloride of magnesium, with 100 grms. of sodium, gave 45 grms. of magnesium.

The crude magnesium is put into a charcoal tray, enclosed in a tube of charcoal, and heated nearly to whiteness, whilst a slow current of hydrogen traverses the apparatus. The tube is strongly inclined in the furnace, and all the magnesium condenses in front of the tray and is easily collected when the tube is cold. It is then fused in a mixture of chloride of magnesium, chloride of sodium, and fluoride of calcium. By gradually increasing the quantity of the latter, which is added by degrees to the fused bath, the scoria is rendered less fusible than the magnesium, so that the latter may be poured off just as the scoria is about to solidify.

When the current of hydrogen is strong in the distillation of magnesium, a small quantity of a fine metallic powder is carried a good way, and remains suspended in the hydrogen which escapes from the apparatus. If this gas be ignited it produces a most beautiful flame.—*Chem. Gaz., April*, 1857, *from Comptes Rendus, Feb.*, 1857.

ON SCILLITIN.

By M. Marais.

[The following notice of scillitin is taken from an extended essay on Squill by the author, accessible in the *Chemist* for April, 1857, and in the *Journal de Pharmacie*, Feb., 1857. According to the author squill

contains the following substances, viz., vegetable mucilage 30; sugar 15; tannin 8; acid red coloring matter 10; yellow odorous acid coloring matter 2; fatty matter 1; scillitin 1; iodine *traces;* salts 5.—EDITOR AM. JOURN. PHARM.]

M. Marais has devoted the fifth chapter of his work to the recapitulation of the numerous attempts which he made, before succeeding, in isolating the active principle of the squill, to showing the best method of obtaining it, and of defining its characteristics.

Struck with the persistence of the acid reactions of the active principle of the squill, which he found in all the products of the analysis, by means of the bitter taste which characterises it, he has supposed that it exists in the plant in a state analogous to a salt, and that the intervention of an alkaline base would be necessary to its elimination. These various considerations have led him to the following process:—

Prepare a concentrated tincture of squill with alcohol, at 0·90 or at 0·56, according to whether the squill is fresh or dry. This tincture is precipitated with clear milk of lime, and on to the whole is poured a sufficient quantity of ether to form, when the mixture is agitated and suffered to stand, a magma covered with a certain quantity of alcoholic and ethereal liquor, which is immediately decanted. The magma is washed with fresh ether until it has lost all its bitterness. The united liquors are distilled, until there only remains in the retort the alcohol, with the scillitine and a little fatty matter. This solution evaporated as rapidly as possible at a gentle heat, leaves a residue, which is taken up again with alcohol at 90° to dissolve the scillitine, and eliminate the fatty matter; the bitter liquor, evaporated in its turn to complete dessication, leaves the scillitine, which is removed in little lamellæ, and immediately put into a well closed phial.

There only appears to be about one per cent. of scillitine in the squill. It is uncrystallizable, hygrometric without being deliquescent, because insoluble in water; it is very soluble in alcohol and ether without heat. It is in pale yellow semi-transparent lamellæ; if, after being dissolved in a little alcohol it is precipitated by water, it is deposited very white, but it retakes its color and semi-transparency by dessication. It has a

penetrating intensely bitter taste, which is increased by the presence of water.

Concentrated sulphuric acid dissolves scillitine, causing a beautiful violet color, exactly similar to that which the same acid produces with cod-liver oil. Water instantly causes the disappearance of this color, and the deposition of a green precipitate. If, after adding a very little water more sulphuric acid is added, the original color reappears.

Concentrated nitric acid dissolves scillitine, causing a bright red color, which disappears quickly. The addition of water forms no precipitate. Whether concentrated or weak, hydrochloric acid does not dissolve scillitine, and gives no characteristic reaction. Hydrated alkalies disengage ammonia from scillitine, and thus show that it contains nitrogen.

Concentrated solutions of ammonia and potassa do not dissolve scillitine, but they decompose it and remove its bitterness. It gives a pale yellow precipitate with tannin; with perchloride of iron, an orange precipitate; with perchloride of platinum, a yellow precipitate.

Projected on a sheet of platinum heated to redness, it liquifies, turns brown, catches light, swells up, becomes black, and disappears without leaving any residue.

Scillitine resembles the alkaloïds in many points, which further experiments will doubtless render evident. Its reaction is alkaline, it contains nitrogen and forms a combination with acetic acid.

Scillitine has been the subject of several toxicological studies made by Dr. Gosselin, assisted by M. Adrien Bussy. These experiments have given the following results:—

1. That Scillitine has all the characters of the acro-narcotic poisons described by Orfila.

2. That it is very poisonous in the dose of five centigrammes, and causes a strong inflammation of the digestive apparatus, even in the dose of from three to four centigrammes.

3. That when injected into the œsophagus, its first effect is to produce vomiting and violent purging; narcotism then manifests itself, and death appears to ensue from paralysis of the heart.

4. That scillitine, applied by the endermic method, acts much

more quickly than by way of the stomach, that its action in this case is almost exclusively narcotic, and that it killed a rabbit in 37 minutes, in the dose of 0·02 gr., and a vigorous dog in an hour and 22 minutes, in the dose of 0·04 gr.

NOTE ON THE TRANSFORMATION OF SOLUBLE GUMS INTO INSOLUBLE GUMS.

By M. A. Gelis.

Although gummy matters are found in almost all plants, they have hitherto been the subject of very few observations. M. Guérin Vary is almost the only chemist who has studied in a consecutive manner their analysis and their transformations. He has extracted from natural gums various substances, all of which possess the property of giving mucic acid when they are heated with nitric acid, and from all these substances he formed a genus whose species are—Arabine, Bassorine, and Cerasine. Berzelius has not adopted this division; he gives the name of *gum* only to matter soluble in water, which forms almost the whole of gum Arabic and gum Senegal, and he separates, under the designation of vegetable mucilage, the principle insoluble in water, which communicates to the gum of Bassora, to gum tragacanth, to linseed, and to quince-seed, &c., the property of swelling up very considerably in this liquid.

The analogy which exists between gums and starch, and the apparent resemblance which is observed between paste and vegetable mucilage, led us to think that this property of swelling up in water which certain gummy matters possess, was due to a kind of organisation existing, in different degrees, in a different species. According to this view, and by establishing, for gum, a series parallel to that of starch, we should be in some measure forced to consider cerasine and bassorine as representatives of organised fecula, and arabine as the analogue of dextrine. The observation which forms the subject of this note is of a nature to lead us to the contrary opinion, since, by heating gum Arabic—that is to say, by placing it in conditions of disorganisation, I have converted it into a principle possessing all the properties of the mucilage of Berzelius.

When powdered gum Arabic is heated to 100° C. (212°F.), a certain quantity of water is removed from it, and its composition may then be represented by the formula $C^{12}H^{11}O^{11}$. At 120°C. (248°F.), it loses another equivalent of water, and becomes isomeric with very dry starch, $C^{12}H^{10}O^{10}$. In this state it has experienced no change in its nature; it is still entirely soluble in water, with the exception of a slight calcareous deposit which precipitates from its solutions. But when the temperature of 120°C. (212°F.) is exceeded, and that of 150°C. (302°F.) reached, or if it be only continued for a long time, it is remarked that almost the whole of the gum loses its solubility, and is converted into a mucilaginous matter, insoluble in cold water. This reaction is effected without loss of water, as I ascertained by weighing several times the flask in which I heated the dried gum; and it is quite comparable to that which converts starch and soluble starch into dextrine.

To obtain the perfectly colorless product, several precautions must be taken. It must not be heated, for gum is very rapidly colored by the action of fire. At the temperature of 150°C. (302°F.), the parts nearest to the metallic bath or the oil bath are perceptibly yellow, but the centre of the mass has been modified without coloration.

Gum thus treated is insoluble in cold water, and it is separated, by means of this liquid, from that which has not been altered. It swells up in cold water much less than tragacanth, but quite as much as the cerasine extracted from the gum of this country. When, instead of heating gum Arabic in powder, we heat it in pieces, the product obtained acts in water like the gums of cherry and apricot trees, &c., from which it would be very difficult to distinguish them.

In presence of these characters, we are tempted to admit the identity of the two matters, especially when we reflect that the metamorphosis which forms the subject of this note is produced without loss of water, and that cerasine and arabine have exactly the same composition in hundredths.

Be this as it may, modified gum, or artificial cerasine, has all the known properties of the mucilage of Berzelius.

Treated with nitric acid, it furnished me an abundant crys-

tallization of mucic acid, and, like gum tragacanth and indigenous gum, it gives rise, by boiling in water, to a new soluble gum.

This gum is generally regarded as arabine; I thought at first that it should rather be analogous to the gummy matter which MM. Biot and Persoz obtained by boiling 8 parts of gum Arabic in 17½ parts of warm water, acidulated with 2 parts of sulphuric acid, a matter which they compared to dextrine; but I dare not yet express myself positively, for this regenerated gum acts at 150°C. (302°F.) like arabine itself, and constantly reproduces artificial cerasine.

The question might perhaps be decided by examining comparatively the rotatory power of these substances, but having no instrument, I have not yet been able to make this verification.—*London Chemist, May*, 1857, *from Comptes Rendus, Jan.* 26, 1857.

VALERIANATE OF AMMONIA.

This substance appears to attract considerable attention, as a remedy for neuralgia, and has been the subject of a somewhat unseemly squabble among certain members of the Parisian faculty; but with this we have no concern. When we first saw a notice of it in the periodicals, we could find no mention of its mode of preparation; and as the dose spoken of was by spoonfuls, manifestly of a solution of unknown strength, we were thrown on our own resources to prepare it. Accordingly, we mixed equivalent solutions of valerianate of zinc and carbonate of ammonia, and removing the carbonate of zinc thus formed by filtration, evaporated the filtered liquid, and finding that it would not crystallize, dried and powdered the residue. We found this to be a very expensive process, the product being considerably less than what theory would lead one to expect. M. Laboureur being, like ourselves, without a guide, has also been experimenting; but the process which he adopted was to pass dry ammoniacal gas through mono-hydrated valerianic acid, when he obtained a product perfectly white, and confusedly crystallized. Its composition is, one equivalent of valerianic acid, one of water, and one of

ammonia; or, one equivalent of valerianic acid, and one of oxide of ammonium, according to the theory you adopt. It is very deliquescent; when placed on water or alcohol it gyrates rapidly, according to the custom of the valerianates. It has a mixed odor of valerianic acid and of ammonia, but soon loses the latter when put in an exhausted receiver. Its reaction is slightly acid, even when dissolved in water or alcohol. Ether dissolves it, forming an oily liquid; so do the oils, although more slowly. Oil of turpentine gives it the appearance of transparent plastic fat. Heat partially decomposes it, and what remains re-crystallizes by cooling. The acids decompose it, liberating the valerianic acid, which swims on the surface of the liquid.

It appears now, however, that the medicine first introduced to the notice of the profession by Déclat, is a solution of valerianate of ammonia of a fixed strength, which has long been prepared by M. Pierlot, a pharmacien in Paris, and which has been extensively exhibited to the epileptics, both at the Salpêtrière and the Bicêtre. M. Pierlot has at length published his formula, which is as follow:—

Distilled water, 32 drachms,
Valerianic acid, 1 drachm,
Sub-carbonate of ammonia, q. s.

To neutralise the acid, add—

Alcoholic extract of valerian, 2 scruples.

His object in the construction of this formula, he says, was to obtain a concentrated solution of all the constituents of valerian root, in a condition as little disagreeable as possible. He maintains that valerianic acid pre-exists in the root, and is an educt, not a product, as hitherto presumed.

However that may be, there seems to be some virtue in the medicine. Dr. Desmarres describes a case of intense choroiditis, in which, after considerable depletion and low diet, severe paroxysms of neuralgia supervened. Doses of a grain and a half of sulphate of quinia seemed merely to exasperate the pains. He then tried Pierlot's solution of valerianate of ammonia, in doses of three coffee-spoonfuls per diem; and the first day the pains so far remitted, that the patient obtained a tranquil sleep, and in a few days more he quite recovered his appetite. Dr.

Tufnell, Professor of Military Surgery in this city has also tried it in some cases, and found it eminently successful.—*London Chemist, May*, 1857, *from Dublin Hospital Gazette.*

SANTONIN AS AN ANTHELMINTIC.

By G. G. Perry, Esq., Droxford.

The very satisfactory effects of Santonin in expelling round and thread intestinal worms are not generally known. Mr. Perry, who has tried its effects in many cases, says:

Among the first cases treated, was that of a child of two years of age, to whom I gave three grains of santonin, followed in two hours by an aperient powder; this child voided the next morning, at one time, thirty-seven worms, some of them a foot in length, of the lumbricoid ascaris kind. Two children in another family were similarly treated, and between forty and and fifty worms came from each; again, in a family of four, 124 worms at one time, and many more afterwards, followed the aperient, each child having taken one dose of santonin. I could instance many more cases which have been relieved by this medicine. After the expulsion of the worms, I give a tonic mixture, containing the muriated tincture of iron and muriatic acid, and change the diet from a vegetable one to that of meat and bread. My cases all do very well.

I should state that santonin is a medicine that may be administered with perfect safety. I give it in its crystallized form, between bread and butter, and two hours after it a dose of calomel and jalap; in some cases an interval of twenty-four hours occurs before the worms are voided.

The persons who reside in the locality in which I have met with these cases, are very poor, and from the high price of bread this winter, have had recourse to vegetables of the commonest description, as an article of food, which will account for the presence of worms in the alimentary canal.—*London Chemist, May*, 1857, *from Medical Times and Gazette.*

CHROMATE OF POTASSA AND SULPHURIC ACID REAGENTS FOR DIFFERENT ORGANIC BODIES.

By Prof. Eboli, of Lima.

A number of organic alkalies and other bodies give, with the above tests, very characteristic reactions, and may, according to the author, prove very useful in chemico-legal examinations. One or two milligr. of the substance are placed on a watch glass, then five or six drops of diluted sulphuric acid (equal weights of acid and water) are dropped on it, and a small piece of chromate of potassa put in the liquid. Each of the following changes of color occupies several hours :—

Morphia: nickel green, copper green, at last a dirty dark green.

Sulph. Morphia: nickel green, copper green, dark yellow.

Acet. Morphia: nickel green, copper green, greenish blue.

Quinia: Scheele's green, beautifully green yellow, dark green.

Sulph. Quinia: nickel green, copper green, dirty yellow.

Ferro-cyan. Quinia: dirty green, leaf green, dirty yellow, chocolate color.

Cinchonia: Scheele's green, green yellow, dirty dark yellow.

Sulphate Cinchonia: Scheele's green, copper green, dirty dark yellow.

Veratria: dirty green, bottle green, nickel green turbid, afterwards clear, copper green turbid, at last dirty dark yellow.

Atropia: after several minutes nickel green, yellow green, dirty yellow green, and a yellowish precipitate soluble in alcohol.

Delphinine: dirty green, clear, then turbid nickel green, dirty yellowish.

Lupuline: greenish yellow turbid, dirty green yellow.

Codeine: Scheele's green, nickel green, copper green, dirty dark green.

Daturia: copper green, greenish blue.

Strychnia: intensely violet, almost black near the chromate, violet yellow, after two days blue. Graham and Hoffmann had already observed the violet reaction.

Caffeine and Naphthaline: no reaction.

Piperine: greenish yellow, nickel green, dirty green.

Cantharidine must be heated with concentrated sulphuric acid

to near boiling, the fire removed and the chromate added, an effervescence takes place, after which a beautiful green mass is found, which dissolves after several hours and at last turns a dirty leaf green.

With a solution of the chromate the above reactions take place instantaneously, so as to make it impossible to observe the changes of color. J. M. M.

Chem. Central Blatt, 1856, 338. *Messagero de Lima.*

NOTICE.

TO THE PHARMACEUTISTS AND DRUGGISTS OF THE UNITED STATES.

The Sixth Annual Meeting of the American Pharmaceutical Association will be held in the city of Philadelphia, on Tuesday, 8th of September ensuing, at 3 o'clock, P. M., in the Hall of the College of Pharmacy, Zane st. above 7th.

The object of the Association, and the conditions of membership are explained in the following extracts from the Constitution.

Article I.

1st. To improve and regulate the drug market by preventing the importation of inferior, adulterated or deteriorated drugs, and by detecting and exposing home adulteration.

2nd. To establish the relations between druggists, pharmceutists, physicians and the people at large, upon just principles, which shall promote the public welfare and tend to mutual strength and advantage.

3rd. To improve the science and the art of pharmacy by diffusing scientific knowledge among apothecaries and druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, and encouraging home production and manufacture in the several departments of the drug business.

4th. To regulate the system of apprenticeship and employment so as to prevent as far as practicable, the evils flowing from deficient training in the responsible duties of preparing, dispensing, and selling medicines.

5th. To suppress empyricism, and as much as possible to restrict the dispensing and sale of medicines to regularly educated druggists and apothecaries.

Article II.—*Of the Members.*

Section 1. Every pharmaceutist or druggist of good moral and professional standing, whether in business on his own account, retired from business or employed by another, who, after duly considering the objects of

the Association and the obligations of its Constitution, is willing to subscribe to them, is eligible to membership.

Section 2. The mode of admission to membership shall be as follows: Any person eligible to membership may apply to any member of the Executive Committee, who shall report his application to the said Committee. If after investigating his claims they shall approve his election, they shall at the earliest time practicable report his name to the Association, and he may be elected by two-thirds of the members present on ballot. Should an application occur in the recess, the members of the Committee may give their approval in writing, which, if unanimous, and endorsed by the President, shall constitute him a member, and the fact be reported to the Association at the next succeeding meeting.

Section 4. Every member shall pay into the hands of the Treasurer the sum of two dollars as his yearly contribution, and is liable to lose his right of membership by neglecting to pay said contribution for three successive years. Members shall be entitled, on the payment of three dollars, to receive a certificate of membership signed by the President, Vice-Presidents and Secretary, covenanting to return the same to the proper officer on relinquishing their connection with the Association.

Section 5. Every local Pharmaceutical Association shall be entitled to five delegates in the annual meetings, who, if present, become members of the Association, on signing the Constitution, without being ballotted for.

Geo. W Andrews, President.

Baltimore, May, 1857.

Varieties.

Extract from an elaborate Report to the British Government on the mode of detecting Vegetable Substances mixed with Coffee for the purpose of adulteration. By Prof. Graham, Dr. Stenhouse and Mr. Campbell.

[The Report from which this extract is taken is too extensive for introduction into this Journal. Those who wish to consult the whole paper will find it in the April and preceding numbers of the Pharmaceutical Journal. Unusual interest attaches to the 11th section, from the facts there stated in reference to Kinone.—Ed. Am. Journ. Pharm.]

The action of the more ordinary chemical reagents upon infusions of coffee and chicory may now be noted. The indications thus obtained with coffee are unfortunately rendered much less characteristic by the torrefaction of the seed.

TABLE X.

Action of certain Chemical Reagents upon Infusions of Coffee and Chicory.

	Raw Coffee.	Roasted Coffee.	Raw Chicory.	Roasted Chicory.
Potassa	A bright reddish-yellow liquid, and no precipitate.	Brownish-yellow liquid, and no precipitate.	Not altered.	Not altered.
Lime-water	Pale-yellow liquid; on standing, becoming green at the surface, no precipitate.	Reddish-brown, with shade of purple, and no precipitate.	Not altered.	Not altered.
Acetate of copper	Dirty green precipitate.	Brownish-green precipitate.	Pale-green precipitate.	Gelatinous precipitate of a reddish-brown color.
Perchloride of iron	Deep greenish-black precipitate.	Very dark greenish-black precipitate.	Blackish-brown colored liquid.	No effect.
Nitric acid	Bright red-colored liquid.	Clear port-wine-colored liquid.	No effect.	No effect at first; on standing, port wine color.
Sulphuric acid	Dirty blackish-brown-colored liquid	Dark blackish-brown colored liquid.	Deep blackish-brown-colored liquid.	Brownish-black liquid.
Hydrochloric acid	Pale brownish yellow liquid.	Port-wine-colored liquid.	No effect.	Slightly darkens the liquid.

In allowing a solution of unroasted coffee to stand, its green color becomes gradually deeper. This change is due to oxidation and the formation of the viridic acid of Rochleder. It is promoted by the presence of an alkali; an excess of lime brings out this color very strongly in a day or two,—giving at first, however, a bright yellow color. Subacetate of lead gives, in unroasted coffee, a yellow precipitate, which does not become green. An excess of acetate of copper gives a green precipitate in abundance, which is brightened by the addition of an alkali. This copper precipitate has been used as a green pigment. The reactions above described are, however, much altered and obscured by the roasting of the coffee, and are therefore of little service for our present purpose.

It has already been stated that iodine produces no blue coloration in the infusion of either coffee or chicory. If the reagents named act clearly in a different manner upon any infusion from what they do upon pure coffee, a presumption of adulteration is obtained, but the indications must be of a positive and specific nature fully to establish adulteration.

Coffee was submitted to the usual process of distillation with soda-lime for the determination of its nitrogen. The proportion of nitrogen per cent. was, in coffee, sample 1 (Table VII.), roasted, 2·93; in sample 2, roasted,

2·62; in sample 3, raw, 2·53, roasted, 2·70; in sample 4, raw, 2·71; in sample 5, raw, 2·50, roasted, 2·49, The proportion of nitrogen in roasted coffee appears therefore to lie between two and a half and three per cent.

The nitrogen in a specimen of foreign chicory amounted in the raw chicory, to 1·51 per cent.; in the same roasted, 1·42 per cent. The same of English growth gave, in the raw state, 1·86 per cent. of nitrogen; and in the roasted state, 1·74 per cent.

The proportion of nitrogen in coffee is therefore greater than in chicory; but the difference is not sufficiently marked to distinguish the two substances easily from each other. The conclusion may, however, be drawn, that less than two per cent. of nitrogen in coffee is a strong presumption of adulteration.

We may now advert to the peculiar and characteristic substances found in coffee, and the aid to be derived from them in the discovery of adulteration.

Professor Rochleder, who has devoted great attention to the analysis of coffee, gives the following enumeration of the substances found in the raw coffee-bean, with the formulæ of their elementary composition:—

		C.	H.	O.	N.
Woody fibre		12	10	10	
Cane-sugar		12	11	11	
Fat	Palmitic acid	32	32	4	
	Oleic acid	36	34	4	
	Glycerine	6	8	6	
Legumin		48	36	14	6
Caffeic acid		16	7	6	
Caffeine		16	10	4	4

To these Rochleder had lately added citric acid ($C_{12}H_5\ O_{11} + 3HO$), in the small proportion of two grains in a pound of coffee; also a trace, too small to be estimated by weight, of viridic acid ($C_{14}H_6\ O_7$). This last substance is the acid obtained by exposing solutions of the neutral and basic caffeates to the influence of the air. The green color of raw coffee is believed by Rochleder to be owing to a small quantity of viridate of lime.

The evidence upon which Rochleder rests the existence of palmitic and citric acids in coffee does not appear to us quite decisive. The formulæ given by that chemist for both caffeic and viridic acids are doubtful.

It is also stated by Rochleder, that when dried caffeic acid is submitted to destructive distillation, a small quantity of crystals were obtained, which he considered to be pyrocatechine. The experiment repeated by us on a considerable scale gave a negative result.

Rochleder finds caffeic acid in Paraguay tea (*Ilex Paraguayensis*), as well as in coffee. This statement we must also doubt. The acid of the Paraguay tea has been examined by us, and found to have a certain resemblance to caffeic acid, but not to be identical with it. Free caffeic

acid, when strongly heated in an open vessel, emits the peculiar odor of roasted coffee; but the acid from Paraguay tea emits a perfectly different odor when similarly treated.

The sugar of coffee may be inferred to exist in a peculiar condition, as was before hinted, from the fact that when the coffee is roasted, none of its sugar appears to be converted into grape-sugar, as it does not affect Trommer's test; while, when seven grains of cane-sugar were added to 100 grains of coffee, and the whole roasted in the usual way, abundant indications of grape-sugar were obtained by the same test.

M. Payen gives the proportional quantities of the different substances which he finds in raw coffee as follows:—

Cellular tissue	34.000	Nitrogenous portion . . .	3.000
Hygroscopic water	12.000	Free caffeine	0.800
Fats . . . . 10. to	13.000	Thick insoluble ethereal oil .	0.001
Starch, sugar, dextrin, and vegetable acids	15.000	Aromatic oil	0.002
Legumin	1.000	Mineral constituents; potash, lime, magnesia, phosphorus, sulphur, silica, and traces of chlorine	6.697
Chlorogenate of potash and caffeine	3.500		

Payen's chlorogenic acid is the same as the caffeic acid of Rochleder and Pfaff. Payen believed that he had obtained from coffee a crystalline double salt of this acid, containing potash and caffeine; but this observation has not been confirmed.

The proportion of fat in the coffee-bean is remarkably high, being generally stated at ten or about ten per cent. We found at least 8.9 per cent. of fat readily extracted by ether. In chicory the proportion of natural fat is scarcely appreciable; but it is brought up by the fat added in the process of roasting the chicory.

10. Some uncertainty existing respecting the proportion of the active principle, caffeine, in coffee, the point was particularly inquired into. The following process was adopted:—The raw coffee was ground fine, having been previously well dried at 212° to facilitate that operation. A decoction was then made of 1000 grains, by the repeated application of boiling water, so as to exhaust the coffee of all soluble matter. The solution was concentrated a little by evaporation. The acid of the coffee, and certain other substances, were now entirely precipitated by the addition, first, of the neutral acetate of lead, and then of the subacetate of lead. These insoluble matters were removed from the liquid by filtration. The excess of lead in solution was then thrown down by means of hydrosulphuric acid.

The liquid, after this preparation, was evaporated to dryness, and the dry matter left was exhausted by means of strong spirit of wine (sp. gr. 0.840). The alcoholic solution was concentrated by evaporation, and allowed to stand in a nearly syrupy state for about ten days, in order to crystallize. The crystals, which are caffeine, were collected upon a small filter, and com-

pressed powerfully to remove the mother-liquor. These crystals were re-dissolved in a small quantity of water, the solution evaporated, and crystallized anew. It gave almost nothing but caffeine, in long silky white needles, with little or no color. The proportion of caffeine, obtained in five experiments, made upon different samples of coffee, was as follows:—

Caffeine in raw coffee.

In Native Ceylon	0.80	per cent.
" " "	0.80	"
" " "	1.01	"
" Plantation Ceylon	0.54	"
" "	0.83	"

The caffeine of the wild coffee appears to exceed that of the cultivated plant; the mean proportion of caffeine in Native Ceylon being 0.87 per cent., and in Plantation Ceylon 0.69 per cent.

The mean average of the whole five samples is 0.80 per cent. of caffeine. Probably the actual quantity of caffeine in the coffee-bean is from 0.75 to one per cent., allowance being made for losses in the separation.

The proportion of theine (or caffeine) in tea is considerably greater, and more easily extracted. Two pounds of fine strong Congou yielded 293 grains of theine, or 2.09 per cent.

When it is merely desired to extract caffeine from raw or roasted coffee, without reference to quantity, the general process for the extraction of organic bases by means of ether suffices. Lime is added to the infusion of coffee, which is then evaporated to dryness upon a water-bath. The extract may be divided by means of clean sand, and then agitated with ether. The caffeine crystallizes as the ether evaporates, or it may be re-dissolved in water, and crystallized again. We believe that the caffeine from ten per cent. of coffee in a mixture might be extracted in sufficient quantity for its identification by the preceding simple process. Caffeine, when once obtained, is fully recognized by its easy sublimation, and also by its action with nitric acid, in which it resembles uric acid. When the solution of caffeine in nitric acid is evaporated to dryness, and exposed to ammoniacal gas it is covered by a pink blush, like murexide.

The only substances besides coffee in which caffeine is known to exist, are tea, Paraguay tea, and a species of chocolate made from the *Guarana officinalis* or *Paullinia sorbilis*.

11. Chemists generally are disposed to refer the flavor and peculiar properties of coffee, as a beverage, more to its acid—the *caffeic acid* (particularly after that substance is modified in its properties by roasting), than to any other constituent of the seed. Rochleder considers this acid as belonging to the tannin class of substances, and calls it tanno-caffeic acid. But as caffeic acid does not precipitate gelatine, it is deficient in the most characteristic quality of the tannic acids. Caffeic acid, in the present state of our knowledge, appears to be confined to the coffee-plant.

We have observed a property of caffeic acid which facilitates the detection of that substance, and consequently of coffee, in a mixture. Caffeic acid appears to be analogous to kinic acid, the acid of cinchona barks, for it yields kinone when oxidated by means of sulphuric acid and binoxide of manganese. To observe this property, the coffee is boiled with water and a little slaked lime, the infusion filtered, and evaporated down to the consistence of a syrup. The syrupy liquid is then mixed in a retort with four times its weight of binoxide of manganese, and one part of oil of vitrol diluted with an equal bulk of water. Sufficient heat is produced by the action of sulphuric acid upon the other materials, to bring over the greater portion of the kinone, and the lamp need not be applied till towards the close of the operation. The distillate consists of yellow crystals of kinone, which usually coat the neck and sides of the retort, and a bright yellow liquid, which is a saturated aqueous solution of kinone, with a considerable quantity of formic acid. Kinone is easily discernible by its volatility and peculiarly acrid odor, which greatly resembles that of chlorine. The solution of kinone gives with ammonia a sepia-black color, and becomes reddish-brown with hydrosulphuric acid. It is decolorized by sulphurous acid. The beautiful green hydrokinone is obtained by exactly neutralizing the solution of the yellow kinone with sulphurous acid, great care being taken not to introduce the latter in excess.

The peculiar acid of Paraguay tea agrees with caffeic acid (to which it is no doubt related) in yielding kinone to similar oxidizing agencies; so does the acid of the leaves of common holly (*Ilex aquifolium*) tea, and the whole of the *cinchona* tribe.

The *prune* tribe of plants, including the sloe, cherry, laurel, &c., the seeds of which yield prussic acid, all contain amygdalin, or some similar principle. Now all of these, when oxidized in the same manner as the former class, yield oil of bitter almonds, and so can be recognized.

The *willow* and *poplar* tribe, on the other hand, yield oil of *Spirea ulmaria* (salicylous acid), a very characteristic substance.

The tests for kinone can be applied in a few minutes, and they are sufficient to indicate the presence of ten or twelve per cent. of coffee in a mixture.

12. The root of *chicory* presents no feature of a marked nature, beyond its large proportion of sugar and the composition of its ash, which have both been sufficiently adverted to. The proportion of fat naturally in the root, is quite insignificant. In an infusion of the fresh undried root, neutral acetate of lead appears to throw down the whole acids of chicory, and the subacetate of lead produces no further precipitate in the liquid. But the root appears to undergo a considerable modification by being dried at a temperature not exceeding 212°. Its infusion now gives a second precipitate with subacetate of lead following the neutral acetate. Both of these precipitates can be well enough washed; but when the attempt was made to decompose either of them by means of hydrosulphuric acid, a mucila-

ginous liquid was obtained, from which the sulphide of lead does not fall, unless with a considerable addition of alcohol. The acid precipitates appear most indeterminate, and afford nothing crystalline. A great deal of pectin-looking substance is present. Chicory also appears to possess about one-fourth of the quantity of inulin that is contained in the dried root, and starch in no other form, the infusion of chicory giving only a brown with iodine, and no blue. Chicory appears to contain no oxalic, malic, citric, or any other crystallizable organic acid. The other sweet roots, beets, turnips, &c., also, like chicory, present little that is tangible in their chemical properties. But the dark color of the infusions of all these roots when roasted, the great density of their solutions, and their fermentability, afford sufficient means for distinguishing them from coffee, and for discovering their admixture with that substance.

The properties of a great variety of other vegetable substances, which might possibly be employed in the adulteration of coffee, are exhibited in the early tables of this Report.

The Gums and Resins of Commerce. By P. L. Simmonds.

(Continued from page 230.)

East Indian Gum Kino.—This, one of the most useful indigenous gum resins of the East, is the produce of the *Pterocarpus marsupium*, Roxburgh. The gum flows out on longitudinal incisions being made in the bark, which being fleshy and very thick, is easily done. It trickles down in a tenacious semi-fluid form, and is collected in a cocoa nut shell. On exposure to the sun in flat plates, it soon hardens into angular brittle shining fragments, of a bright ruby color, highly astringent, and readily soluble in hot water. The gum changes into a blood red color by alkalies, which, however, destroy its astringent properties. It is precipitated by the salts of iron, silver, lead, &c., and, with sulphate of iron forms a fine ink. It dissolves readily in water, to which it imparts its own beautiful color.

Another variety of Indian kino exudes during the hot weather from natural fissures and wounds in the bark of the *Butea frondosa*, a very common leguminous tree. It is known in commerce by the name of Bengal kino, or gum butea, being closely allied to the kino of Pterocarpus, in its chemical and medicinal properties. The natives of India use it for tanning, but as it imparts to the leather a red color, it is considered objectionable by European tanners. Kino is commonly used in medicine for its astringent properties, especially in diarrhœa, chronic dysentery, and other such cases.

Amber.—The source of amber was long uncertain; by some it was considered a carbonaceous mineral, but it is now universally supposed to be a vegetable resin, the product probably of a Pinus. It is too well known in pearance to need description. It has several commercial uses. Being commonly translucent, and susceptible of a good polish, it is made into

ornaments as necklaces. It is the base of an excellent varnish, and the source of succinic acid, which is employed in chemical investigations. The beautiful black varnish used by coach-makers, is a very carefully prepared compound of amber, asphaltum, linseed oil, and oil of turpentine. Amber often contains insects, flies, ants, spiders, &c., some of which are so delicately formed that they could not have occurred except in a fluid mass, such as a volatile oil or natural balsam. Mr. Wallis, of Longacre, has one of the largest and most interesting collections of these fossil insects I remember to have seen, and they occur not only in amber, but occasionally in the courbaril resin of South America, in copal and anime, and in copal from Accra. In its appearance and physical properties, amber strongly resembles copal, which is often fraudulently sold for it in the Indian bazaars.

We derive our chief supplies from Prussia, where it is thrown up on the coast between Konigsberg and Memel. The imports in the last few years have averaged about 40 cwts. yearly. Large deposits of amber were found a few years ago in some lakes on the eastern coast of Courland, not far from the Gulf of Riga; and in January, 1854, a bed of yellow amber, apparently of great extent, was found on sinking a well at Prague, from which pieces weighing two and three pounds were extracted. The largest block known is in the Royal Cabinet at Berlin, and weighs thirteen pounds.

This fossil is also found in Madagascar, in Japan, on the shores of the Indian Archipelago, and in small quantities on the coast of China. It forms a considerable item of import in the Chinese ports, the greater portion coming from the eastern coast of Africa; its value there formerly was very great as an incense and for ornaments. Transparent yellow pieces are considered the best, and the price in the East, as here, varies according to size and quality; for its color ranges from black and yellow through red and white. A resin called false amber—no doubt a copal—is among the exports from Calcutta to Great Britain to the extent of several tons.

LAC.—This important resinous substance, which comes into our ports from the East Indies in various forms, to the extent now of 2500 tons per annum, is obtained from the incrustations made by an insect (*coccus lacca*), similar to the cochineal insect on the branches and twigs of many trees in India, as *Vatica laccifera, Butea Frondosa Inga dulcis, Feronia elephantum, Erythrina indica, Schleichera trijuga*, &c. The lac is formed by the insect into cells, somewhat resembling a honeycomb, in which the insect is generally found entire, and owing to whose presence stick lack yields by proper treatment a red dye, nearly, if not quite, as bright as that obtained from cochineal, and more permanent.

Lac is found encircling the branches of these trees in the form of a tube, (half an inch to one inch in diameter,) the broken branches, with incrustation at various distances, is called in commerce stick lac, which ought to be semi-transparent. The coloring matter, exhibited by grinding stick

lac, and then treating it with water, constitutes seed lac. I have on the table specimens in the various forms, of the crude stick lac attached to branches of various trees, seed lac, lump lac, shellac, thin plates of a yellowish and brown color, known as button lac, thread lac, and bleached or white lac of the shops.

The range of production of this resin is very extended, reaching from Bombay to the Eastern Archipelago, Ganjam, Nepaul, Burmah, the jungles of the Malay Peninsula, and those of Southern India. In the latter district it is not much collected for commercial purposes, although always procurable in the bazaars. The best lac is produced there upon the *Schleichera trijuga*, or corumb tree, which abounds in the Central Provinces, and yields the coloring matter twice a year. Burt lac is produced in the Rajpootana States, on the *Fiscus indica* and *religiosa*, *Zizyphus jujuba*, and *Acacia concinna*.

The resin in stick lac constitutes about 68 per cent.; in seed lac 88 per cent.; and in shellac 91 per cent. The wax, which forms about 5 or 6 per cent., is analogous to myrtle wax.

Editorial Department.

Meeting of the American Pharmaceutical Association.—The attention of our readers is directed to the call of the President of the Association, at page 370, which explains the object of the Institution, and the conditions of membership. Like the Medical Association, it has been instituted to promote the professional interests of the body by elevating the individual, inviting each well disposed pharmaceutist and druggist to partake in its advantages and usefulness. Now by this we do not mean that an apothecary, by being a member, will add a certain number of dollars to his income,—possibly it may not increase it a dime. But we do mean that it will open a field wherein he can glean much that may be improving to himself, and at the same time, without loss, enable him to extend a useful influence to others less enlightened and successful than himself. The tendency of the Association is opposed to concentrating business and knowledge in the hands of a few—its aim is to aid all earnest members of our profession to raise their standard of practice by personal exertions, to disseminate information, and to encourage correct practice among all. Freed as it thus is of all exclusive pretensions, it merits general support, to enable t to extend the full amount of usefulness it is capable of doing. Already its "Proceedings" have furnished valuable and interesting papers, quoted in our own and European Journals, and this feature is but just budding, having only commenced last year. We have reason to believe that the ensuing meeting will be marked with great interest in this regard, from the number

of subjects portioned out to Committees for investigation. The gentlemen who voluntarily undertook the labor of research, will doubtless feel an honorable desire to accomplish their several investigations in good time, so as to avoid the necessity of so humiliating a report as is exhibited in the proceedings of the Medical Association at Nashville, in May last, wherein three-fourths of the reports were either not received, or the Committee asked for more time. The members and others who may not have received a copy of the Proceedings, will find a list of those Committees and their subjects in the November number of this Journal for 1856.

The Philadelphia College of Pharmacy are taking measures to accommodate the Association in their Hall, where there will be ample room for the display of any specimens or other objects of interest the members and new comers may bring. It is particularly desirable that every gentlemen proposing to attend, should, before leaving home, ask himself if there is anything that he can contribute to the interest of the meeting; either in the form of a paper on any subject appropriate to the occasion, or of specimens of pharmaceutical preparations, rare drugs, etc. In Cincinnati, in Baltimore, in Detroit, in Boston, in New York, in New Orleans and Richmond, there are doubtless preparations known only in those places, and which are there highly esteemed, and which the pharmaceutists of those places would gladly see in the Pharmacopœia. Let the gentlemen from those places bring specimens of them to the meeting; and let all see them and compare them; and if it should be decided to appoint a committee in reference to the next revision of the Pharmacopœia in 1860, this committee will properly take them in hand and report on them next year.

From accidental causes Philadelphia has heretofore had a prevailing influence in the construction and remodeling of our National Medical Codex, and by some the work has been thought too local in its character. If this has been the case, it has not been by design, and the proper way to remedy it is, for the physicians and pharmaceutists of all sections to do their share of the preparatory labor, that the revising committee, when appointed at Washington in 1860, will know what the profession needs.

In concluding, we would suggest to the many pharmaceutists and druggists who come to this city and New York from the South and West on business, that they keep in view the time of the meeting of the Association (Sept. 8th), and arrange their plans so as to be in attendance.

The Plant, an illustration of the Organic Life of the Animal. By Harland Coultas, author of "the Principles of Botany as exemplified in the Cryptogamia, etc." Philadelphia. Perry & Errety, publishers. 1855. Pp. 180, 12mo.

The object of the author in the publication of this volume appears to be to claim more consideration for Botany as a branch of scientific education, but more especially of medical education, as he believes the great advance

made recently in the study of animal physiology to be chiefly due to the initiative researches and discoveries in the functions of vegetable life by Mirbel, Mohl, Schleiden, and others, by which the cell origin of animal structure has been demonstrated. We agree entirely with the author in regard to the unmerited neglect of botanical studies by medical, as well as pharmaceutical students, to whom it is more *necessary* than to any other classes of community. It is, perhaps, not easy to give the true causes for this neglect; yet among them is the prevailing disposition in our schools to *facilitate* the process of obtaining diplomas by *simplifying* the curriculum to meet the convenience of imperfect scholarship. So palpable is the neglect of even structural botany among medical students, that a professor of materia medica who enters with any minuteness into the description of medical plants, is too frequently voted a *bore*, and his lessons thrown away. Another cause, perhaps, is the lack of able teachers to win the student in spite of his disinclination for the science. Let our institutions place botany beside chemistry as a collateral branch of medical instruction, and we have the remedy.

Investigations, Chemical and Physiological, relative to certain American Vertebrata. By Joseph Jones, M. D., Professor of Chemistry in the Savannah Medical College. Washington City. Published by the Smithsonian Institution, July, 1856. New York; G. P. Putnam & Co. Pp. 137, quarto. From the Author.

This work has evidently involved a large amount of labor and research which nothing but true love of science could have stimulated and sustained. In the several chapters the author has studied, 1st, method of analyzing the blood. 2d, the blood of vertebrate animals in its normal condition. 3d, physical and chemical changes of the solids and fluids of animals when deprived of food and drinks. 4th, effects of starvation and thirst, combined with a change of diet upon the fluids and solids of carnivorous chelonians. 5th, observations upon the alimentary canal, and digestion of albumen and flesh. The remaining five chapters are severally on the pancreas, liver, spleen, kidney and urine of cold-blooded animals.

Drs. Samuel Jackson, Joseph Leidy and Jeffries Wyman constitute the the Commission to whom the work was referred for examination by the Smithsonian Institution.

Valedictory Address to the Graduates of the Maryland College of Pharmacy, delivered March 6th, 1857. By Charles Frick, M. D. With a list of the Graduates. Published by the Trustees of the College. Baltimore, 1857; pp. 25, octavo.

The tone of Dr. Frick's address is excellent, and its style unexceptionable. We congratulate our Baltimore brethren on their possession of so able and accomplished a teacher.

Rapport a l'académie Impériale de Reims sur l'introduction, et la culture du Pin noir d'Autriche dans les plaines stériles de la Champagne; par M. Le Docteu. LEUCHSENRING, membre correspondent. Reims, Aout 1855. Pp. 28, octavo.

This pamphlet is on the introduction of the Black Pine of Austria as a forest tree into Champagne, France, where much sterile soil suited to its growth exists. Much more attention is devoted to arbor-culture in Europe, where the primitive forests have to a much greater extent disappeared before the wants of society, than in this country. About a century ago the Larch was extensively introduced into the Scottish Highlands by the Duke of Athol, and his descendants at this day reap a large income from the timber yielded by the forests thus begun. It is quite time that some of our own political economists should direct public attention to, and demonstrate the feasibility and importance of, planting forest trees of native and foreign varieties of value. Already the destruction of timber on our mountains and highlands is modifying the condensing power of those primal sources of rivers, and deteriorating the value of the latter as highways of traffic.

OBITUARY.—Within the past year death has been busy among men eminent in science, and it is right to place a record of his doings on our pages, devoted though they be to but one department of knowledge.

JOHN AYRTON PARIS. This excellent and distinguished man died at his residence in London on the 24th of December, 1856, in the seventy-second year of his age, having been at born at Cambridge on the 7th of August, 1785. Dr. Paris commenced the study of his profession when but fourteen years old, and manifested great zeal in its pursuit; he graduated early at Caius College, Cambridge, and afterwards studied at Edinburgh. He was elected Physician to the Westminister Hospital at twenty-two, but soon resigned the appointment and moved to Penzance, in Cornwall. Whilst residing here he founded the Royal Geological Society of Cornwall, and gave to the Cornish miner a great boon in the "Tamping-bar," an instrument by which he is able to pursue his business among inflammable gases without fear of striking fire from the rock. In 1810 he returned to London, and then continued the practice of medicine until two weeks before his death. He was elected President of the London College of Physicians in 1844, which distinguished position he held till death. His abilities as a physician were of the highest order, and his literary attainments quite remarkable. "The Life of *Sir Humphrey Davy* will ever remain one of the classical biographies of the English language." The Pharmaceutist knows him chiefly through his *Pharmacologia* and his "*Medical Chemistry.*" Besides these he wrote works on *Diet, Medical Jurisprudence*, and on "*Philosophy in Sport.*" He suffered much a few days previous to his decease, but retained his intellect clear and bright while speech remained.

HUGH MILLER.—On the same day with Dr. Paris, (Dec. 24, 1856,) but

under very different circumstances, Scotland lost one of her brightest sons. Hugh Miller, who from the humble ranks of the quarry men, rose to an eminent position among British geologists, and who has done so much to "popularize and Christianize science," whilst under the influence of an overwrought brain, died by his own hand. Though possessed of a strong frame and large brain, they were insufficient to meet the exorbitant demands of an unceasing application. For some time before his death his nervous system gave indications of disorder, and had he been as familiar with its workings as with those strata whose history he has written with so much power, he would have perhaps avoided the sad catastrophe which terminated at once his labors and his life. During his latter days he became possessed with the idea that his museum would be robbed, and provided fire arms to repel intruders; horrible dreams disturbed his rest, and inability to get refreshing sleep became at last a source of serious anxiety, and concentrated in self-destruction.—(*Silliman.*)

His works, "Foot-prints of the Creator, or the Asterolepis of Stromness," and "My Schools and Schoolmasters," are well known, and he had just completed his "Testimony of the Rocks" the day before his death.

Dr. Andrew Ure, so long and favorably known in connection with technical chemistry, died on the 2d of January, 1857, after a short illness, at the age of seventy-eight. Dr. Ure was born in Glasgow in 1778, and studied in its University. He afterwards studied in Edinburgh and graduated in medicine at his native city in 1801. In 1804 he was appointed Andersonian Professor of Chemistry and Physics in Glasgow. In 1809 he was attached to the newly established Glasgow Observatory, where he remained several years. A series of valuable papers in the Journals marked his progress from year to year. In 1818 he described the Eudiometer which bears his name. In 1821 his "Dictionary of Chemistry" was published. In 1830 Dr. Ure became a resident of London, and was appointed chemist to the Board of Customs in 1834. In 1835 he published "The Philosophy of Manufactures," and in the next year "The Cotton Manufacture of Great Britain." His celebrated "Dictionary of Arts, Manufactures and Mines" was first published in 1837, and by it he is most extensively known in this country from an American reprint. This great work has gone through several editions.

Possessed of indefatigable industry and enthusiastic love of his scientific labor, Dr. Ure accomplished an amount of results surprising to an ordinary mind. He was consulted extensively by manufacturers in the adaptation of processes and machinery to scientific principles, and from the observations accumulating from this source no doubt arose his great Dictionary of Arts, &c.

Although his health was failing during his three or four last years, his faculties were bright and his scientific pursuits were kept up until within a few days of his death.

Dr. Ure was an honorary member of the Pharmaceutical Society of Great

Britain, and one of its early friends. We feel it but justice to use the language of Mr. Bell (from whose obituary notice in the Pharmaceutical Journal the above facts are chiefly taken) in relation to this fact. "Among the scientific men who gave their countenance and encouragement to the Pharmaceutical Society at its establishment in 1841, the name of Dr. Ure is gratefully remembered. At that time the business of a chemist and druggist was only recognized as a respectable trade, and the endeavor to invest it with anything like a professional character by the establishment of a regular pharmaceutical qualification was considered by most persons a chimerical project. At that critical period, the sanction, and presence at the meetings, of men enjoying a high position in chemistry and the sciences, had a very encouraging influence on the prospects of the new Society.

"Several of the 'friends in need,' who in considerable numbers thus came forward as its promoters, have passed away, and have been noticed with regret in our obituary. We have now to offer a sincere tribute to Dr. Ure, to whom we are indebted not only for his frequent attendance at our early meetings, but for interesting lectures delivered to the members, and papers which have appeared in the *Transactions* of the Society."

William C. Redfield, favorably known in the United States for his meteorological and geological researches, died in New York on the 12th of February, at the age of sixty-eight. Mr. Redfield's theory of storms, broached in 1831, has gained many advocates, and with his other labors has given him a prominent place among modern meteorologists, especially as his discoveries are of much practical importance to the navigator.

Jacob W. Bailey, professor of chemistry, mineralogy and geology at the U. S. Military Academy at West Point, died on the 26th of February last of consumption.

Prof. Bailey devoted his leisure chiefly to microscopic research, in which direction he has done much more than any other American, and his labors have won him a position among microscopists deservedly high. Those who knew him describe his life as being "without reproach, his gentleness and modesty, his earnestness for truth rather than self, his untiring energy even when his physical system seemed to be dissolving away from his spirit, make a character that excites love as well as admiration."—(Silliman).

Prof. M. Tuomey, an eminent geologist of the Southern States, died at Tuscaloosa, Alabama, on the 30th of March last. He accomplished the geological survey of South Carolina, and was engaged in that of Alabama at the time of his death, and was also in the Chair of Geology in the University of Alabama at Tuscaloosa.

Prof. John Locke, of Cincinnati, died on the 10th of July, 1856, in the 65th year of his age. Prof. Locke, though a teacher of chemistry, devoted much of his time to researches on subjects of general science, especially electro-magnetism, and claimed to be the discoverer or inventor of the electro-chronograph.